

TERRESTRIAL VERTEBRATE FAUNA OF THE KAIPAROWITS BASIN

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ABSTRACT.— This report includes data collected during an investigation by Brigham Young University personnel from 1971 to 1976, as well as a literature review. The fauna of the Kaiparowits Basin is represented by 7 species of amphibians (1 salamander, 5 toads, and 1 tree frog), 29 species of reptiles (1 turtle, 16 lizards, and 12 snakes), 153 species of birds (plus 2 hypothetical), and 74 species of mammals. Geographic distribution of the various species within the basin are discussed. Birds are categorized according to their population and seasonal status. Avian habitat relationships are discussed, and extensions of range are reported for 5 species of birds. Three threatened or endangered avian species occur in the basin. Four avian species seem to have declined significantly in numbers in recent years.

The early activities and exploration of trappers, missionaries, and government survey workers provided little information to our knowledge of fauna in the Kaiparowits Basin. Most of these early expeditions skirted around the basin on all sides or were confined to the depths of the Colorado River Canyon. The Dominguez-Velez de Escalante party traveled along the north side of the Colorado River between Lee's Ferry and the well-known Crossing-of-the-Fathers. During this portion of their journey, it became necessary for the party to eat their horses (Auerbach 1943). No mention is made in Father Escalante's journal of any fauna observed. Records of Powell's expeditions of 1869–1870 and 1871–1872 indicate observations of wildlife were limited to the larger game animals, probably those that could be used for food.

In 1892 the American Museum of Natural History sent an expedition into the San Juan region just east of the Kaiparowits Basin (Allen 1893). Wetherill, Flattum, and Sterns (1961) made a trip by boat up the Colorado River from Lee's Ferry to Rainbow Bridge. Both expeditions recorded the animals observed.

The number of scientific investigations after those of Powell into the Glen Canyon were few indeed (Crampton 1959). The National Park Service recognized this fact and, in measure, filled some of the gaps by sending out an expedition that descended by boat

the San Juan and Colorado Rivers to Rock Creek. From this point, they spent about two weeks on the southwest end of the Kaiparowits Plateau. The results of this work were reported by Hall (1934). Others such as Gregory (1917, 1938, 1945, 1947, 1948) and Gregory and Moore (1931) have made substantial contributions to our knowledge of the Colorado River drainage, particularly with respect to the geology. Observations and comments were also recorded regarding the biota.

Members of the Department of Zoology at Brigham Young University (BYU) initiated a series of biological investigations of the upper Colorado River Basin; of these, the following were within the Kaiparowits Basin: In July 1927, a group visited Lee's Ferry and Bryce Canyon, and in 1936, a party of four biologists spent 810 man hours in the Escalante River drainage. In the fall of 1937, V. M. Tanner and C. L. Hayward studied in the Paria Valley. A party headed by D. E. Beck entered the region in the fall of 1938 and 1939, exploring the course of the Escalante River. Beck also spent the last part of May and early June of 1940 in the area east of Willow Tank Spring down to the Escalante River. In 1946, 1952, and 1953, other BYU expeditions entered the area in both Kane and Garfield Counties. The Navajo Mountain and Wahweap Drainage were visited in 1955 and 1958 (Hayward et al. 1958).

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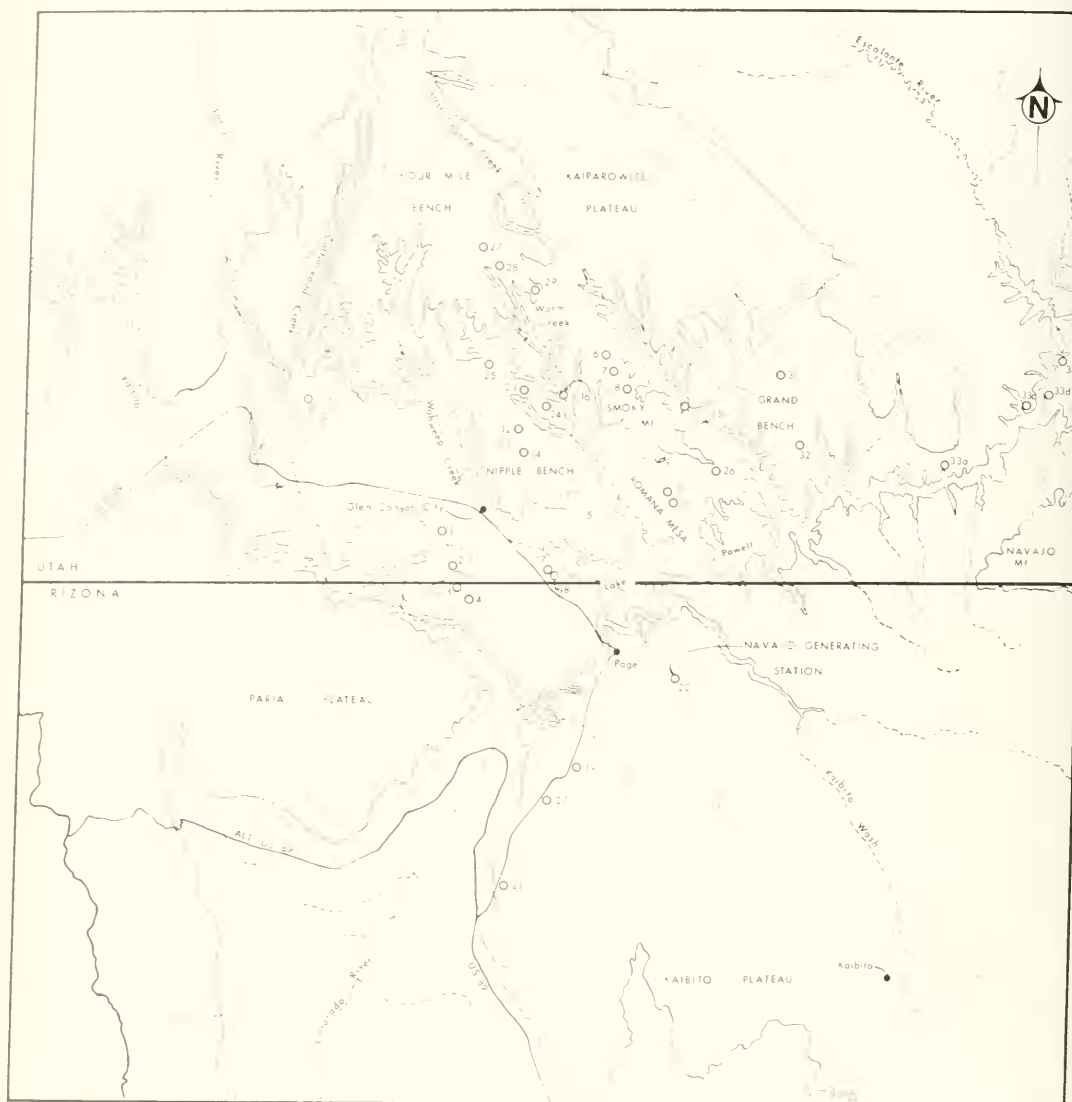


Fig. 1. Map of Brigham Young University Navajo-Kaiparowits study sites, Kane and San Juan Counties, Utah, and Coconino County, Arizona.

Benson (1935) published an important paper on the fauna and flora collected during an expedition led by Alexander, Kellogg, and Benson in the Navajo Mountain region in 1933. They had six stations as follows: one five miles south of the mountain, 10–12 June; one at War God Spring on top of the mountain at 8400 feet, 13–20 June; one at Bridge Canyon, 21–24 June, two on the mesa south of the mountain; and the other near Navajo Mountain Trading Post, 25–26 June. In addition, naturalists assigned to Bryce Canyon

National Park have, since 1932, made contributions toward our knowledge of the fauna and flora of the region.

Woodbury and Russell (1945), in their comprehensive report on the birds of the Navajo country, presented data on specimens collected and observations made in Glen Canyon, on Navajo Mountain, and on Kaiparowits Plateau. Behle and three associates made a boat trip down the Colorado River 13–17 April 1947. They made observations at various places between Hite and Lee's Ferry,

including the mouth of the Escalante River, river mile 88; Hidden Passage, river mile 76; Aztec Creek, river mile 68.5; Crossing-of-the-Fathers; near Creek, river mile 40.5; and Lee's Ferry. Behle and associates also collected birds at or near the confluence of Calf Creek and the Escalante River, 11–14 June 1953, and 7–9 May 1954 (Behle et al. 1958; Behle 1960). In 1958, Behle and Higgins (1959) made some observations at Hole-in-the-Rock (20 October), and the confluences of Kane Creek and the Escalante River with the Colorado River (19 October); birds were observed by Harold Higgins and Gerald Smith on a river trip extending from 1 July to 9 August 1958 from Hite to Lee's Ferry (Behle and Higgins 1959). We have not given the precise dates in the species accounts given below of birds collected or seen by Behle and his associates on June 1953 and May 1954 trips, or for Benson's (1935) trips in 1933, because of the short duration of their investigations. If desired, such can be obtained from the literature. The dates of observations from our investigations, however, are reported herein.

In 1957, the National Park Service initiated a salvage program for the Glen Canyon area preparatory to the construction of Glen Canyon Dam. These data were published by the University of Utah and the Museum of Northern Arizona in their respective journals. Earlier (as a result of a reconnaissance trip, 8–14 August 1957, and as a part of the same project), Woodbury et al. (1959) had prepared an annotated checklist of the birds of the proposed Glen Canyon Reservoir area from various sources, including published and unpublished manuscript records. In addition, Behle and Higgins (1959) published a number of previously unpublished bird observations from Woodbury and Russell's field notes from the Rainbow Bridge-Monument Valley expedition.

In June 1971, Brigham Young University and Northern Arizona University initiated the Environmental Impact Studies for the Navajo and later in 1972 for the proposed Kaiparowits Generating Stations. Extensive collections and observations of the terrestrial vertebrate fauna and flora have been made by these groups.

This report on the terrestrial vertebrate fauna is based on species reported in the literature and collections or field observations made by BYU personnel from 1971 to the fall of 1976. The various taxa in the annotated lists are arranged phylogenetically following the order given in Schmidt (1953) for the amphibians and reptiles; the American Ornithologists Union (AOU) Check List, Fifth Edition (1957) and subsequent supplements for the birds; and Hall and Kelson (1959) for the mammals.

Most of the studies dealing with the distribution and ecology of amphibians and reptiles within the Kaiparowits Basin have been restricted to areas along the Colorado River. The stretch of river generally known as Glen Canyon Gorge has been the area most commonly studied. The most comprehensive list (28 taxa) of amphibians and reptiles for this area was by W. W. Tanner (1958a). Woodbury et al. (1959) published a similar list, but it contained only 19 taxa. Both of these studies were designed to obtain data prior to the construction of Glen Canyon Dam and subsequent development of Lake Powell. As part of the Navajo-Kaiparowits environmental baseline studies, Toft (1972) prepared a field key based on the above literature and field observations and collections made during the summer of 1971 and 1972. Additional data have been added from subsequent studies made during the period of 1973–1975. These studies represent to date the most extensive field studies into the interior of Kaiparowits Basin.

AMPHIBIANS

Ambystomidae (Salamanders)

Ambystoma trigrinum nebulosum Hallowell. Utah Tiger Salamander. V. M. Tanner (1930) and Weight (1932) Bryce Canyon. W. W. Tanner (1975).

Pelobatidae (Spadefoot Toads)

Scaphiopus hammondi Baird. Hammond's Spadefoot Toad. V. M. Tanner (1930) and Weight (1932) Bryce Canyon.

Scaphiopus intermontanus Cope. Great Basin Spadefoot Toad. V. M. Tanner (1940a).

TABLE 1. Vegetation types and locations of permanent sites for Brigham Young University Navajo-Kaiparowits study.

Site No.	Vegetation type	Location
1.	<i>Oryzopsis-Stipa-Ephedra</i> <i>Vanceleva</i>	At the base of <i>Cedar Mt.</i> on loose, deep sand, 3.2 mi W of GCC through the highway fence. T 43 S R 2E SW Part of the NW quarter of Sec. 21.
2.	<i>Juniperus-Bouteloua</i>	On <i>Cedar Mt.</i> 4.1 mi on from Site 1. Approx. 20 yds N of fence on left of road. Exclosure 100 yd N of fence and W 30 yd R 44 S T 2E NE corner of Sec. 3.
3.	<i>Hilaria-Ephedra</i>	<i>Cedar Mt.</i> Approx. 1.3 mi on from Site 2. Road is headed W and ca 50 yd before Pole Line on left. R 44 S T 2E Center of Sec. 10, ca 100 yd from state line. Kane Co., UT.
4.	<i>Coleogyne</i>	<i>Cedar Mt.</i> 0.8 mi on from Site 3 after turning left under Pole Line. R 6E T 42N SW part of the NE quarter of Sec. 5.
5.	<i>Atriplex corrugata-Atriplex confertifolia</i>	Approx. 7.0 mi East GCC near U.S. W. B. and Dames and Moore weather station on <i>Dakota formation</i> on right, ca 75 yd from W. B. station.
6.	<i>Pinyon-Juniper-Artemisia</i>	<i>Smoky Mt.</i> 14.2 mi from Last Chance Jct. Turn right .4 mi Site on right of road. On coal mine road turn right at top of Smoky (survey marker) 0.1 mi then left .4 mi T 41S R 4E NE part of the SE quarter of Sec. 5.
7.	<i>Grayia-Coleogyne-Hilaria</i>	<i>Smoky Mt.</i> 12.3 mi from Last Chance Jct. on top. E of road near dead juniper. T 41S R 8E NE part of the SE quarter of Sec. 21.
8.	<i>Grayia-Hilaria</i>	<i>Smoky Mt.</i> 9.1 mi from Last Chance Jct. (on left of road) or 5.2 mi from coal mine road jct. on right side of road. T 41S R 9E SW part of the SE quarter of Sec. 34.
9.	<i>Atriplex-Kochia-Artemisia spinescens</i>	Base of <i>Smoky Mt.</i> 2 mi on from Ahlstrom Point Jct. on left. Turn off road in bottom of small wash to dead end at ca .2 mi Site 20 yd N. T 42S R 5E NW part of the NW quarter of Sec. 30.
10.	<i>Oryzopsis</i>	<i>Ahlstrom Point Road</i> 4.7 mi from Ahlstrom Point Jct. T 43S R 5E SE part of the NW quarter of Sec. 8.

Table 1 continued.

Site No.	Vegetation type	Location
1.	Coleogyne	<i>Ahlstrom Point Road</i> 5.0 mi or .3 mi from Site 10. T 43S R 5E NE part of the SE quarter of Sec. 8.
2.	Coleogyne	<i>Nipple Bench</i> In first well-developed Coleogyne ca 3.5 mi from jct. at top after leaving Tibbet Spring. On left of road, there is a small ridge on right. T 42 S R 3E NE part of the SW quarter of Sec. 9.
3.	Grayia-Ephedra-Oryzopsis Bouteloua-Hilaria	<i>Nipple Bench</i> Approx. .6 mi on from Site 12. Turn up wash to the right ca 50 ft into Sec. 17 from marker, which is .1 mi off road up the woods. T 42 S R 3E NE part of the NE quarter of Sec. 17.
4.	Grayia-Coleogyne-Bouteloua	<i>Nipple Bench</i> Approx. 1.1 mi S of SE corner 17 on W of road, 2.1 mi S Site 13 T 42 S R 3E SE part of the SW quarter of Sec. 21.
5.	Populus-Tamarix-Lycium	<i>Last Chance Creek</i> 31.8 mi from GCC turn up creek bottom ca 1 mi T 41S R 5E SE part of the SE quarter of Sec. 4.
6.	Tamarix-Chrysothamnus	Salt Wash at <i>Middle Branch Creek</i> Across the creek and ca 40 yd downstream from washed out stock watering pond. T 41S R 4E SE part of the SE quarter of Sec. 35.
7.	Sporobolus-Oryzopsis	<i>Stateline</i> 7.6 mi from GCC on Utah side of border turn left toward Lone Rock Marina from U.S. 89. Approx. .2 mi on right of road.
8.	Coleogyne	<i>Stateline</i> Same as above except on left of road 75 yd and on a slight rise.
9.	Coleogyne	<i>Windmill</i> 9.3 mi S of Page on 89 on left of highway on pullout by reflector post. T 39N R 8E SE part of the NW quarter of Sec. 10.
10.	Bouteloua-Hilaria- Muhlenbergia	At mi post 535 ca 12 mi S of Page. 50 yd N of post and 20 yd E of road on pullout. T 39N R 8E SW part of the NE quarter of Sec. 20.
11.	Pinyon-Juniper	<i>Echo Cliffs</i> 19.3 mi S of Page turn left and on ridge ca 1/4 mi.
12.	Coleogyne	<i>Navajo Plant Site</i> (undecided)

Table 1 continued.

Site No.	Vegetation type	Location
23.	<i>Coleogyne-Ephedra-Grayia</i>	1.2 mi N Tibbet Spring to jct. and thence 1.6 mi E on Cathy's Flat Road 50 yd N of road. T 41S R 3E NE part of the SE quarter of Sec. 33.
24.	<i>Hilaria-Ephedra-Grayia</i>	2.1 mi E Site 23. Approx. .2 mi beyond end of road. T 42S R 3E SE part of the NE quarter of Sec. 3.
25.	<i>Atriplex confertifolia</i>	To be selected near Cathy's Flat.
26.	<i>Atriplex corrugata</i>	100 yd W of small twin flat-tops at Last Chance Summit on S of road ca 13 mi E of Warm Creek Jct. T 42S R 5E east central part of the SE quarter of Sec. 25.
27.	Pinyon-Juniper	<i>The Pine</i> Approx. 3 mi from cow camp at head of Wesses Canyon. T 40 S R 2E part of the SE quarter of Sec. 2.
28.	<i>Artemisia tridentata</i>	$\frac{1}{4}$ mi W Drip Jct. 40 yd SW from Dead Juniper on S of road. T 40S R 3E NE part of the SW quarter of Sec. 7.
29.	Pinyon-Juniper	Farthest distance out on Drip Point. T 40S R 3E SE part of the NE quarter of Sec. 21.
30.	Grass-Ephedra	T 41S R 1W NE part of the SW quarter of Sec. 27. Brigham Plains Bench, ca 5 mi N of U.S. Highway 89, E of Paria River.
31.	<i>Coleogyne</i>	Grand Bench ca 50 mi E of Glen Canyon City. T 42S R 6E.
32.	<i>Oryzopsis</i>	Grand Bench ca 54 mi E of Glen Canyon City. T 42S R 6E.
33.	Moist hanging gardens with thin-leaved genera of trees and shrubs various genera of herbaceous plants.	
33a.	<i>Cercis</i> , <i>Cladium</i> , <i>Rhamnus</i>	In Driftwood Canyon on the N side of Lake Powell ca 1 mi NW of Rainbow Bridge Canyon. T 43S R 8E.
33b.	<i>Ostrya</i> , <i>Cirsium</i> , <i>Rubus</i>	Ribbon Canyon, between San Juan Drainage and Hole-in-the-Rock on the E side of Canyon. T 41S R 10E.
33c.	<i>Quercus</i> , <i>Celtis</i> , <i>Populus</i> , <i>Baccharis</i> , grass/forb	Reflection Canyon (Cottonwood Gulch), between San Juan drainage and Hole-in-the-Rock on the W side of canyon. T 42S R 9E.

Table 1 continued.

Site No.	Vegetation type	Location
33d.	Quercus, Cercis, Cirsium Forb/grass	1 mi N of confluence of Colorado/San Juan Rivers, on E side of canyon. T 42S R 9E 55 mi E of Glen Canyon City in East Chance Creek. T 41S R 6E.
34.	Tamarix-desert shrub	R 42S R 9E 55 mi E of Glen Canyon City in East Chance Creek. T 41S R 6E.

Willow Tank Spring and confluence Calf Creek/Escalante River; Hayward et al. (1958) Navajo Mountain; Russell and Thompson (1964) Bryce Canyon; BYU (1972) Grosvenor Arch.

Woodbury et al. (1959) Bridge Canyon, Hole-in-the-Rock, Hidden Passage, Rock Creek, West Canyon, Padre Creek, and Warm Creek; Russell and Thompson (1964) Bryce Canyon; BYU (1972) Escalante River, Reflection Canyon, and Ribbon Canyon.

Bufonidae (Toads)

Bufo cognatus Say. Great Plains Toad. BYU (1971) Site 15.

Bufo punctatus Baird & Girard. Red-spotted Toad. V. M. Tanner (1940a) Willow Tank Spring; Woodbury et al. (1959) Bridge Canyon, Rock Creek, Hidden Passage, Aztec Canyon, Rainbow Bridge, and Warm Creek; BYU (1971-1973) Warm Creek, Escalante drainage, Wahweap Creek, Driftwood Canyon, Reflection Canyon, and Three Garden.

Bufo woodhousei Girard. Woodhouse's Toad. V. M. Tanner (1940a) Tropic, Escalante, and Escalante River; Hayward et al. (1958) Navajo Mountain; Woodbury et al. (1959) Rock Creek and Kane Creek; Russell and Thompson (1964) Bryce Canyon; BYU (1972-1973) Cottonwood Wash Spring, Reflection Canyon, and Tibbet Spring.

Hylidae (Treefrogs)

Hyla arenicolor Cope. Canyon Tree Frog. V. M. Tanner (1940a) confluence of the Escalante/Colorado River; Hayward et al. (1958) Paria Valley; Woodbury et al. (1959) Bridge Canyon and Rock Creek; BYU (1972-1973) Driftwood Canyon and Three Garden.

Ranidae (True Frogs)

Rana pipens brachycephala Cope. Western Leopard Frog. V. M. Tanner (1940a) confluence of the Escalante/Colorado Rivers;

REPTILES

Emydidae (Water and Box Turtles)

Chrysemys picta belli Gray. Western Painted Turtle. Woodbury et al. (1959) Rock Creek, Labyrinth Canyon, and three miles above Face Canyon; Miller (1966) Hole-in-the-Rock.

Iguanidae (Iguanid Lizards)

Crotaphytus collaris subssp. Western Collard Lizard. Records of *C. c. baileyi* Stejneger are: V. M. Tanner (1940a) Paria River and Henrieville; Woodbury et al. (1959) Rainbow Bridge and Rock Creek; W. W. Tanner (1958a) collected specimens between Lee's Ferry and Tuba City and indicated, "intergradations of subspecies *C. c. baileyi* and *C. c. auriceps* occur in the region south of the San Juan River and west of its confluence with Colorado River." BYU (1971-1974) Sites 4 and 11, south base of Navajo Mountain, Glen Canyon, and Nipple Bench. *C. c. biemtores* Smith & W. W. Tanner was named from specimens collected at Crossing-of-the-Fathers. An additional collection of this animal was made by BYU (1971) east of Smoky Mountain.

Crotaphytus wislizenii punctatus Baird & Girard. Long-nosed Leopard Lizard. V. M. Tanner (1940a) Willow Tank Spring, Hayward et al. (1958) Navajo Mountain, Wood-

bury et al. (1959) Last Chance and Lee's Ferry; W. W. Tanner and Banta (1963) Hole-in-the-Rock, Lone Rock, Willow Tank Spring, Catstairs Canyon, Crossing-of-the-Fathers, Navajo Mountain Trading Post, and Lower Wahweap Creek; BYU (1971-1973) Sites 1, 14, and 27, and Cottonwood Wash. Tanner and Banta (1977). W. W. Tanner (1980, pers. comm.).

Sauromalus obesus multiforaminatus Tanner & Avery. Upper Colorado River Chuckwalla. V. M. Tanner (1940a) Warm Creek; Hayward et al. (1958) Paria Valley; Woodbury et al. (1959) Rainbow Bridge, Rock Creek, and Last Chance drainage; W. W. Tanner and Avery (1964) Crossing-of-the-Fathers, Hole-in-the-Rock, Warm Creek, and one mile upstream from Glen Canyon Dam; BYU (1971-1972) Navajo Creek, Warm Creek Bay, Glen Canyon Dam, Grand Bench, and Navajo Creek.

Holbrookia maculata approximans Baird. Lesser Earless Lizard. BYU (1972) Site 20, Tietso Spring, and 13 miles south of Page along U.S. Highway 89.

Sceloporus magister cephaloflaccus Tanner. Orange-headed Desert Spiny-Lizard. V. M. Tanner (1940a) Willow Tank Spring and Wahweap Creek; W. W. Tanner (1954a) Kaiparowits Plateau, Lone Rock, Catstairs Canyon, Escalante River, and 15 miles northwest of Hole-in-the-Rock; Hayward et al. (1958) Navajo Mountain; Woodbury et al. (1959) Bridge Canyon, Rock Creek, and Kane Creek; BYU (1971-1974) Sites 1, 2, 8, 12, 14, 16, 17, and 23, 5 miles south of Page, Tibbet Canyon, Tibbet Spring, Wahweap Bay area, Cottonwood Wash/U.S. 89, and Three Garden.

Sceloporus undulatus elongatus Stejneger. Northern Plateau Lizard. V. M. Tanner (1940a) Cannonville, Escalante, and Calf Creek/Escalante River; W. W. Tanner (1954d) Paria River drainage north of U.S. Highway 89; Hayward et al. (1958) Navajo Mountain; Russell and Thompson (1964) Bryce Canyon; BYU (1973) Tibbet Canyon.

Sceloporus graciosus graciosus Baird & Girard. Great Basin Sagebrush Lizard. V. M. Tanner (1930), Weight (1932), and Presnall (1935) Bryce Canyon; V. M. Tanner (1940a) Calf Creek/Escalante River, Tropic, and Escalante/Colorado Rivers; Hayward et al.

(1958) Navajo Mountain; BYU (1971-1974) south base of Navajo Mountain and at Sites 1, 10, 13, 14, 21, 23, and 27.

Uta stansburiana uniformis Pack & Tanner. Upper Colorado Basin Side-blotched Lizard. V. M. Tanner (1940) Escalante, Willow Tank Spring, and Calf Creek/Escalante River; W. W. Tanner (1954d) Paria River drainage north of U.S. Highway 89; Hayward et al. (1958) Navajo Mountain; Woodbury et al. (1959) Rainbow Bridge Trail and lower Bridge Canyon; Russell and Thompson (1964) Bryce Canyon; BYU (1971-1974) Sites 1, 2, 4, 6, 7, 8, 9, 10, 13, 14, 17, 18, 19, 20, 21, 22, 23, 27, 28, and 30, Glen Canyon City, Four Mile Bench, Three Garden, and Tibbet Canyon.

Urosaurus ornata wrighti Schmidt. Colorado Tree Lizard. W. W. Tanner (1954d) Paria River drainage north of U.S. Highway 89; Hayward et al. (1958) Navajo Mountain; Woodbury et al. (1959) Bridge Canyon, Rock Creek, and Last Chance; BYU (1971) three miles west of Site 19.

Phrynosoma douglasii hernandesi Girard. Short-horned Lizard. V. M. Tanner (1930), Weight (1932), and Presnall (1935) Bryce Canyon; BYU (1972) Sites 14 and 23, and Warm Creek Bay. W. W. Tanner (1975).

Phrynosoma platyrhinos calidairum Cope. Sonoran Desert Horned Lizard. W. W. Tanner (1954d) Paria River drainage north of U.S. 89; Woodbury et al. (1959) Rock Creek and Lee's Ferry; BYU (1971) Utah-Arizona state line north of Page along U.S. Highway 89.

Xantusidae (Night Lizards)

Xantusia vigilis utahensis Tanner. Utah Night Lizard. W. W. Tanner (1957) records topotypes taken from Trachyte Creek, Garfield Co., Utah; W. W. Tanner (1958b) indicates this species possibly is found within the area defined as the Kaiparowits Basin.

Teiidae (Whiptail Lizards)

Cnemidophorus tigris Baird & Girard. Western Whiptail. Two subspecies occur in the Kaiparowits Basin, viz. *C. t. tigris* (Baird & Girard) reported by V. M. Tanner (1930), Weight (1932), and Presnall (1935) Bryce

Canyon and V. M. Tanner (1940a) Calf Creek/Escalante and Paria River drainage; and *C. t. septentrionalis* Burger reported by Woodbury et al. (1959) from Rainbow Bridge Trail, Beaver Creek, and lower Bridge Canyon, BYU (1971-1973) Sites 1, 2, 6, 13, 16, 17, 19, 20, 22, 23, 27, and 30, and the south base of Navajo Mountain.

Cnemidophorus velox Springer. Plateau Whiptail. Woodbury et al. (1959) Rock Creek; Schmidt (1953) lists *C. sacki innotatus* from Kanab, Kane County.

Cnemidophorus sexlineatus perplexus Baird & Girard. Six Lined Racerunner. V. M. Tanner (1940a) Canonville and Escalante.

Scincidae (Skinks)

Eumeces skiltonianus utahensis Tanner. Great Basin Skink. Russell and Thompson (1964) Bryce Canyon beneath logs and stones.

Colubridae

Thamnophis cyrtopsis cyrtopsis Kennicott. Western Black-necked Garter Snake. Schmidt (1953) lists this species for Utah, Arizona, southern Colorado, New Mexico, and southward.

Thamnophis elegans vagrans Baird & Girard. Wandering Garter Snake. V. M. Tanner (1930), Weight (1932), and Presnall (1935) Bryce Canyon; V. M. Tanner (1940a) Tropic and confluence Calf Creek/Escalante River; Woodbury et al. (1959) Rock Creek.

Masticophis taeniatus taeniatus Hallowell. Desert Striped Whipsnake. W. W. Tanner (1954d) Paria drainage north of U.S. Highway 89; Woodbury et al. (1959) Beaver Creek, Kaiparowits Plateau, and Hole-in-the-Rock; Russell and Thompson (1964) Bryce Canyon.

Salvadora hexalepis mojavensis Bogert. Mojave Patch-nosed Snake. W. W. Tanner (1953) near the old town site of Adairville, Kane County, Utah; W. W. Tanner (1954c) Wahweap Creek, one mile southeast of Lone Rock; Hayward et al. (1958) Paria Valley; Woodbury et al. (1959) Rock Creek; BYU (1971) Paria River three miles south of U.S. Highway 89 and at Glen Canyon City.

Arizona elegans philipi Klauber. Painted Desert Glossy Snake. W. W. Tanner (1964)

14 miles south of Page, 9 miles west of Page, and 2 and 5 miles west of the Paria River all along U.S. Highway 89; BYU (1972) Sites 1 and 3, Arizona-Utah border between Page and Glen Canyon City, and 5 miles northwest of Page.

Pituophis melanoleucus deserticola Stejneger. Great Basin Gopher Snake. Presnall (1935) Bryce Canyon; V. M. Tanner (1940a) Tropic, Escalante, Wahweap Creek, and Willow Tank Spring; W. W. Tanner (1954d) Paria River drainage north of U.S. Highway 89; Hayward et al. (1958) Navajo Mountain; BYU (1971-1973) Sites 1, 2, 14, 17, and 20.

Lampropeltis getulus californiae Blainville. California King Snake. V. M. Tanner (1940a) 30 miles south of Escalante; W. W. Tanner (1958b) undoubtedly extending well into the upper Colorado Basin; BYU (1971-1973) one observed dead on U.S. Highway 89 by Glen Canyon City and another collected west of Cockscomb Ridge near U.S. Highway 89.

Rhinocheilus lecontei lecontei Baird & Girard. Western Long-nosed Snake. W. W. Tanner (1964) Wahweap road at junction with U.S. 89 and Buck Tank Draw.

Sonora semiannulata isozona Cope. Western Ground Snake. BYU (1972) seven miles southeast of Glen Canyon City on U.S. Highway 89. The specimens collected by BYU extend the range of this subspecies into Kane County and east almost to the Colorado River.

Hypsiglena torquata deserticola Tanner. Desert Night Snake. W. W. Tanner (1954b) northeastern Kane County, Utah, in the area south and east of the Vermillion Cliffs; Russell and Thompson (1964) Bryce Canyon.

Hypsiglena torquata loreala Tanner. Plateau Spotted Night Snake. Woodbury et al. (1959) Labyrinth Canyon; BYU (1973) Reflection Canyon.

Tantilla planiceps utahensis Blanchard. Utah Black-headed Snake. W. W. Tanner (1954c) Paria River drainage 38 miles east of Kanab in Catstairs Canyon.

Crotalidae (Rattlesnakes)

Crotalus viridis lutosus Klauber. Great Basin Rattlesnake. V. M. Tanner (1930), Weight (1932), and Presnall (1935) Bryce

Canyon; W. W. Tanner (1958a) indicates that this subspecies ranges east at least to the Paria River. Pritchett (1962) extended the range to the plateau east of the Paria.

Crotalus viridis nuntius **Klauber**. Hopi Rattlesnake. W. W. Tanner (1958a) southeast portion of Navajo Mountain near the Utah-Arizona border and at the confluence of Escalante River, Willow Tank Spring, and Wahweap Creek; W. W. Tanner (1958a) north Escalante/Colorado River junction; BYU (1972-1974) Sites 2, 3, 10, 14, 22, and 28, Tibbet Canyon, two miles southeast of Glen Canyon, Tibbet Spring, and Paria, Utah.

Crotalus viridis concolor **Woodbury**. Midget-faded Rattlesnake. V. M. Tanner (1940a) Tropic, Escalante River, Willow Tank Spring, and Wahweap Creek; W. W. Tanner (1958a) north of Escalante/Colorado River junction; BYU (1972-1974) Sites 2, 3, 10, 14, 22, and 28, Tibbet Canyon, two miles southeast of Glen Canyon City, Tibbet Spring, and Paria, Utah.

BIRDS

Present avian classification systems have divided Fringillidae into two families and have separated them in their positions in the phylogenetic order and have removed other species such as the Bushtits (*Psaltiriparus*) from the families where they have been well established. Additionally, new positions in the phylogenetic order of a number of Passerine families have been proposed. Hayward et al. (1976) have discussed these diverse taxonomic changes in considerable detail and have deviated from the Fifth Edition of the AOU Check-list (1957) to conform with some of the proposed changes. In view of the present diversity of opinion regarding avian classification and because the AOU Check-list committee has not yet made a decision on the proposed changes, we have followed the Fifth Edition of the AOU Check-list and its supplements.

Our ornithological data were collected from July 1971 through February 1974; the number of individual birds seen on a monthly or seasonal basis and the number seen in various vegetational associations on a seasonal basis are biased, since only two years data

were collected for the months of March through June. Also no data were collected in December 1972. The data are biased further by the fact that not every observer determined numbers, nor did they always report the vegetational associations in which they saw the species. Furthermore, the vegetational associations were not sampled equally for bird species composition and numbers; some were sampled more intensively than others. Therefore, our data pertaining to avian seasonal population trends and their preferences for certain vegetational associations are only suggestive. Additionally, since birds usually show decided preferences for the architectural structure of the vegetation rather than the plant species composition of specific associations, many of the plant associations have been lumped into *Pinus-Juniperus* or *Juniperus* associations, often referred to as woodland, riparian (*Populus fremontii*, *Salix*, *Tamarix*) associations, and desert shrubs. Additional data are available on habitat relationships of the vertebrate animals discussed here by comparing the sites (Fig. 1, Table 1) where the animal was seen or collected with the vegetational associations found at that site. All river miles listed for the Colorado River are reckoned from Lee's Ferry.

In the following species accounts, numbers followed by localities and dates refer to the number of specimens taken.

Podicipedidae (Grebes)

Podiceps nigricollis **C. L. Brehm**. Eared Grebe. BYU (1971) 50 seen at Warm Creek Bay, 8 Nov.; BYU (1972) 12 seen at river mile 56, 7 on Lake Powell near mouth of San Juan River, and 17 at Three Garden on Lake Powell, 2 Nov. Behle et al. (1958) regarded the species as a regular spring migrant through the Kanab area. Late fall resident on Lake Powell.

Aechmophorus occidentalis (Lawrence). Western Grebe. BYU (1971) Lake Powell 6 seen on Warm Creek Bay, 8 Nov. and one seen on Wahweap Bay, 1 Dec. A total of 80 Western Grebes were counted at the following localities of Lake Powell 2 Nov. 1972: river miles 12, 14, 17, 18 and 20, Dangling Rope Canyon, Driftwood Canyon, and

Navajo Creek. A 29 June 1973 observation on Lake Powell suggests either a straggler or possible nesting. Late fall transient south-eastern Utah (Behle 1960).

Podilymbus podiceps (Linnaeus). Pied-billed Grebe. BYU (1971) on Lake Powell, one seen at Warm Creek Bay, 8 Nov. and another at Wahweap Bay, 1 Dec.; BYU (1972) 36 were recorded at the following localities on Lake Powell: Gregory Butte near Rock Creek Bay, Dangling Rope Bay, and river miles 12 and 15, 2 Nov. Late fall resident on Lake Powell.

Pelecanidae (Pelicans)

Pelecanus erythrorhynchos Gmelin. White Pelican. Presnall (1937) Bryce Canyon; Woodbury and Russell (1945) three miles below Rock Creek on Colorado River, 28 July 1937. Rare transient.

Ardeidae (Hérons and Bitterns)

Ardea herodias Linnaeus. Great Blue Heron. Behle (1948) Aztec Creek, Rock Creek, Last Chance, and river miles 3, 6, and 21; Woodbury and Russell (1945) one at Lee's Ferry, Aug. 1909 as recorded by the Nelsen and Birdseye trip; Behle and Higgins (1959) from previously unpublished observations of Woodbury and Russell on the Rainbow Bridge-Monument Valley expedition, 23 herons seen from 1 to 11 Aug. 1938; they were seen from 2½ miles below Lee's Ferry to river mile 69, 3100–3200 ft; Behle (1960) common from Hite to Lee's Ferry, May through Oct.; BYU one at Warm Creek/Lake Powell, 8 Nov. 1971 and 3 May 1972; BYU (1973) one at Three Garden alcove, 21 Mar. The presence of a nesting colony at river mile 117 (Woodbury et al. 1959) indicates that the species also nests in the area. Not uncommon resident between 21 Mar. and 8 Nov.

Egretta thula (Molina). Snowy Egret. Woodbury and Russell recorded in their unpublished field notes observing this species at Forbidding Canyon along the Colorado River 18 July 1937 and seeing tracks on shore of Colorado River between river miles 63–69 (Behle and Higgins 1959); Behle (1960) Higgins saw 17 at Wahweap Creek and river

mile 17 and one at the dam site, 7 Aug. 1958; BYU (1972) one seen in *Populus* at Navajo Creek, 27 Apr.; BYU (1973) one seen by Robert Whitmore at junction of Paria River/Colorado River, 6 June (riparian vegetation), and 2 more were seen by Whitmore feeding from a sandbar in the Colorado River one mile north of Lee's Ferry, 15 June. Spring and summer resident, possibly breeds.

Nycticorax nycticorax (Linnaeus). Black-crowned Night Heron. Woodbury and Russell (1945) specimen: river mile 64, 4 Aug. 1938 and six were seen in 65 miles, i.e., between river mile 63 and 2½ miles below Lee's Ferry, between 4 and 11 Aug. 1938; Behle (1948) two were seen 16 Apr. 1947 at Crossing-of-the-Fathers near Kane Creek and another pair seen at Wahweap Creek. None were seen during the present investigation. Summer and spring records suggest breeding.

Threskiornithidae (Ibises and Spoonbills)

Plegadis chihi (Vieillot). White-faced Ibis. Behle and Higgins (1959) reported that Woodbury saw two at river mile 13, 13 Sept. 1957. Uncommon transient along the Colorado River.

Anatidae (Swans, Geese, and Ducks)

Branta canadensis (Linnaeus). Canada Goose. Grater (1947) Bryce Canyon; Behle and Higgins (1959) noted that Woodbury saw two at river mile 50, 12 Sept. 1957; Behle and Higgins (1959) observed a pair of adults with six young that were unable to fly at river mile 106, 16 July 1958; they considered the species a common summer resident and transient in Glen Canyon. Summer resident, possibly nesting near Lake Powell.

Anas platyrhynchos Linnaeus. Mallard. Behle (1948) six were seen near Hole-in-the-Rock; BYU (1971) three were seen on a small islet at Warm Creek/Lake Powell, 8 Nov. Uncommon transient along the Colorado River and Lake Powell.

Anas strepera Linnaeus. Gadwall. Behle (1948) saw a pair at Hole-in-the-Rock, five at the mouth of San Juan River, and two at Wahweap Creek; BYU (1972) five were seen on a pond at Grosvenor's Arch, 2 Mar. and two at Lake Powell/Cottonwood Wash, 22

July (*Ephedra*-grass); BYU (1973) three on a pond near Coyote Creek, 5 June. Uncommon spring and summer resident.

Anas acuta (Linnaeus). Pintail. Behle (1948) six near Hole-in-the-Rock; BYU (1973) two on a pond at Wiregrass Spring, 5 Nov. Spring and fall transient.

Anas crecca (Linnaeus). Green-winged Teal. Woodbury and Russell (1945) one, Colorado River between Rock Creek and Lee's Ferry, 17 Aug. 1937; Behle and Higgins (1959) Woodbury saw seven at river mile 82, 11 Sept. 1957; BYU (1972) three at Wahweap Creek Bay on a rain pond, 30 Oct. Transient Lake Powell and the Colorado River.

Anas discors Linnaeus. Blue-winged Teal. Behle (1948) near Klondike Bar; Behle and Higgins (1959) Higgins saw six near mouth of Rock Creek at river mile 58, 28 July 1958. Uncommon spring and summer transient Colorado River and Lake Powell.

Anas cyanoptera Vieillot. Cinnamon Teal. Woodbury and Russell (1945) one, Paria/Colorado Rivers, 11 Aug. 1938; Behle (1948) mouth of Wahweap Creek; Behle et al. (1958) found one dead on highway south of Escalante, 8 May 1954; Behle and Higgins (1959) reported that in 1958 Woodbury saw one between river mile 63 and 50, 5 Aug. and one at ½ mile below Lee's Ferry, 11 Aug. Spring and summer transient.

Anas americana Gmelin. American Widgeon. BYU (1972) two at Rainbow Landing on Lake Powell, 2 Nov. Uncommon transient on Lake Powell.

Aythiinae (Diving Ducks)

Aythya valisineria (Wilson). Canvasback. Behle (1948) near mouth of Last Chance Creek. Uncommon transient.

Bucephala clangula (Linnaeus). Common Goldeneye. Behle (1948) saw 12 at Crossing-of-the-Fathers, 12 at river mile 36, and 16 at river mile 31; BYU (1972) one at Coyote Creek Pond, 8 Dec. Spring and winter transient.

Bucephala albeola (Linnaeus). Bufflehead. BYU (1972) five on Lake Powell at Warm Creek, 7 Feb.; three on gravel pit pond at Wahweap Bay, 27 Mar.; and a female on Colorado River at Last Chance Bay, 5 July. Uncommon spring and summer transient.

Cathartidae (American Vultures)

Cathartes aura teter Friedmann. Turkey Vulture. Presnall (1934) Bryce Canyon; Behle and Higgins (1959) reported that Woodbury saw two along the Colorado River between miles 13 and zero, 10 Aug. 1938; Woodbury and Russell (1945) one, Navajo Mountain Trading Post on 26 July 1936 and another on 8 Aug. 1936 near Lee's Ferry, and observed on Kaiparowits Plateau; BYU (1971) two seen 12 miles south Page, Ariz., 24 July; BYU (1972) Site 2 (flying), 23 July; Site 12, 16 Apr. 1972 (*Coleogyne*); Site 20; Driftwood Canyon, 24 June; three seen at Dry Rock Creek, 3 May; and one the confluence of the San Juan River/Lake Powell, 17 July. Woodbury and Russell (1945) reported the Turkey Vulture as a common summer resident almost everywhere in the Navajo country area in the 1930s. They observed it nearly every day from 1 June through 15 Sept. over a period of years. Yet, present observations covering a three-year span yielded fewer than a dozen sightings, suggesting a drastic decline in numbers. This is particularly significant when one considers, as noted by Woodbury and Russell (1945), "that this conspicuous bird is seldom missed in observations in both time and space," a factor that tends to overemphasize its occurrence by comparison with less conspicuous birds (Woodbury and Russell 1945). Uncommon summer resident from 28 Mar. to 1 Oct. (in the general area).

Accipitridae (Eagles, Hawks, and Harriers)

Accipiter gentilis atricapillus (Wilson). Goshawk. Woodbury and Russell (1945) Navajo Mountain, i.e., War God Spring, 23 July 1936; Russell and Thompson (1964) Bryce Canyon. Uncommon summer resident.

Accipiter striatus velox (Wilson). Sharp-shinned Hawk. Presnall (1934) Bryce Point; Woodbury and Russell (1945) Navajo Mountain, 13 July 1933, and Kaiparowits Plateau, 30 July 1937, and young birds out of nest being fed by parents on Kaiparowits Plateau, 5-6 Aug. 1937; Benson (1935) base of Navajo Mountain, mid-June 1933; BYU (1971) Site 8, 1 Aug. and one Navajo Mountain, 13 Oct. Fairly common summer resident and spring and fall transient.

Accipiter cooperii (Bonaparte). Cooper's Hawk. Presnall (1934) and Grater (1947) Bryce Canyon; Woodbury and Russell (1945) specimens: Navajo Mountain, 9 Aug. 1935 and 25 July 1936 and two seen nesting on Kaiparowits Plateau, 5 Aug. 1937; Behle and Higgins (1959) Rock Creek river mile 58, 28 July 1958; BYU (1971) two near Site 1 in *Juniperus*, 14 and 18 July; BYU (1973) one at Wahweap Creek, 30 Apr. (*Tamarix* in Salt-wash). Summer resident, spring and fall transient.

Buteo jamaicensis calurus (Cassin). Red-tailed Hawk. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) two at Navajo Mountain, 7 July 1936 at 3250 ft and seen at Beaver Creek, War God Spring, Soldier Seep (Navajo Mountain), and on Kaiparowits Plateau; Behle and Higgins (1959) reported that Woodbury found them common along Colorado River, 4–23 July 1936, and one nest with young hawks was also noted; Behle and Higgins (1959) abundant in Glen Canyon, 1 July to 9 Aug. 1958. BYU (1971–1973) Sites 1, 2, 6, 12, 13, 15, 18, 20, 22, 23, 27, and 30, and Cottonwood Wash, Tibbet Canyon, Cedar Mountain, Grosvenor Arch, Wahweap Creek, and specimen: Cockscomb/Highway 89, 14 Jan. 1972. Recorded every month; April–July (21 seen) and November–January (17 seen). The months January–June are unfairly represented since no records were obtained for these months in 1971. During the winter months most observations were in *Juniperus* and associated species (17), and the remainder were in grass (2), grass-shrub (2), perched on a ledge (2), and in *Tamarix* (1). During the spring and summer nesting season they were seen flying over desert shrubs (9) consisting of *Atriplex*, *Vanceleva*, *Chrysothamnus*, *Artemisia*, and shrub-grass. Four of the nine were in *Coleogyne*; three others were in *Juniperus* and/or woodland, and one each in grass and washbottom situations. Permanent resident.

Buteo swainsoni Bonaparte. Swainson's Hawk. Presnall (1934) reported this species to be common at Bryce Canyon during the summer.

Buteo lagopus (Pontoppidan). Rough-legged Hawk. In 1935 Long (1937) observed one in Bryce Canyon. Sparse winter resident.

Buteo regalis (Gray). Ferruginous Hawk. Long (1937) and Russell and Thompson (1964) Bryce; BYU (1973) one perched on power lines south of Glen Canyon near Warm Creek, 27 Apr. Uncommon transient.

Aquila chrysaetos canadensis (Linnaeus). Golden Eagle. Presnall (1934) Rainbow Point; Grater (1947) Bryce Canyon; Woodbury and Russell (1945) Navajo Mountain and Glen Canyon; Behle and Higgins (1959) sighted adults and immatures near mouth of Aztec Creek, 26 July 1958; BYU (1971–1974) Sites 1, 6, 12, and 23, Glen Canyon City, Church Wells, Cockscomb, Grosvenor Arch, Last Chance Creek, Tibbet Canyon, Wahweap Creek, and Warm Creek. Recorded 42 times at 26 locations during every month of the year except October. Fewest birds were seen October to November and March to April, and most May–August followed by December–February. Only one eagle was seen during our study, in January. The vegetational type over which they were flying or in which they were perched during January–June consisted of desert shrubs (6), cliffs or rock ledges (4), grasslands (2), woodland (1), and washbottom (1). In August, September, and December they were recorded in mixed shrubs and cliffs (4). Common permanent resident.

Haliaeetus leucocephalus (Linnaeus). Bald Eagle. Behle and Higgins (1959) report that Woodbury observed one flying on the east side of the Kaiparowits Plateau below the cliffs north of Glen Canyon, 4 Aug. 1938. BYU (1972) one seen near Rock Creek Bay and another at confluence of San Juan River/Lake Powell, 2 Nov. BYU (1975) Last Chance Wash, Dec. Sparse fall transient, the 4 Aug. bird seen by Woodbury may have been a postnesting eagle from the small nesting populations in central Arizona.

Circus cyaneus hudsonius (Linnaeus). Marsh Hawk. Woodbury and Russell (1945) one, Kaiparowits Plateau, 9 Aug. 1937. BYU (1971) two at Site 17, 27 Aug. grasslands; two at Site 20, 6 Nov. grassland; BYU (1972) specimen (male); Wahweap Creek, 17 Jan. three seen at Wahweap Creek near Glen Canyon City, 7 Feb., 18 Apr., and 3 July (washbottom). Uncommon permanent resident; more common spring and fall transient.

Falconidae (Falcons)

Falco mexicanus Schlegel. Prairie Falcon. Presnall (1934) and Russell and Thompson (1964) Bryce Point; Woodbury and Russell (1945) Navajo Mountain; one seen in Glen Canyon in 1938 between river miles 41 and 25, 8 Aug.; and three on cliffs between miles 13 to zero, 10 Aug.; Behle and Higgins (1959) report that in 1938 the species was seen by Woodbury in two places between river miles 78 and zero, 4 July; Behle (1948) pairs (probably nesting) near mouth of Escalante River and junction of Bridge and Aztec Canyons; BYU (1971) five sightings; Site 3, 16 Aug. (grasslands); Site 15, no date; Glen Canyon City/Wahweap Creek, 1 June 1972 (grasslands); Church Wells, 14 Nov. 1971 (grasslands); and Nipple Creek (chasing dove), 23 May 1973 (washbottom). Common summer resident, less common in spring and fall; probably a permanent resident.

Falco peregrinus anatum (Bonaparte). Peregrine Falcon. Russell and Thompson (1964) Bryce Canyon; Woodbury and Russell (1945) saw peregrines at Navajo Mountain at three different sites, 4–10 July 1936, and at Beaver Creek, Navajo Mountain, 2–16 Aug. 1936; Behle (1960) Glen Canyon near Wahweap Creek, river mile 17, 6 Aug. 1958; BYU (1971) two observations believed to be peregrines (both uncertain) at Site 15, 8 Oct. Undoubtedly the species formerly nested in Glen Canyon, along the Colorado River, and its side canyons as well as on Navajo Mountain. With the construction of Lake Powell, the area may now be more suited for peregrines than formerly (Porter and White 1973). Since early investigators did not examine the area specifically for peregrines, they probably underestimated the size of the population. The entire area now needs to be thoroughly surveyed, especially Lake Powell.

Falco columbarius bendirei Swann. Merlin. Grater (1947) Bryce Canyon.

Falco sparverius sparverius Linnaeus. American Kestrel. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) two 4 Aug. 1935 and 11 July 1936 (9,500–10,000 ft, *Picea-Abies* and *Pinus flexilis*), and seen on Kaiparowits Plateau and at Lee's Ferry; Behle et al. (1958) one seen 10 miles south of Escalante in

stand of *Juniperus*, 6 May 1954; Hayward et al. (1958) Escalante drainage along stream-sides; BYU (1971–1974) Sites 1, 2, 3, 7, 10, 12, 14, 16, 19, and 26; one mile south of Glen Canyon City, two specimens: 26 Aug. and 13 Sept. 1971; Brigham Plains, Cottonwood Wash, Grosvenor Arch, Smoky Mountain, Driftwood Canyon, Tibbet Canyon, Church Wells, Crosby Canyon (nesting on cliff face, 28 Apr. 1973), Lee's Ferry, and Wahweap Creek. Very common (over 75 birds seen at 31 sites); earliest spring sightings, 20 March 1972 (1 Apr. 1973) and latest fall sightings, 7 Nov. 1971 (3 Aug. 1972 and 9 Aug. 1973). The greatest numbers were seen in April (16), June (17), and July (22). Most observations were in desert shrubs in March–July (29). They were also seen in *Tamarix* (2), *Juniperus* (1), saltwash (1), *Juniperus* in March and April (4), grassland (4), and *Tamarix* in May–July. The shrubs represented among the desert shrubs were *Vancevea*, *Atriplex*, *Grayia*, *Chrysothamnus*, *Artemisia tridentata*, *Coleogyne*, and *Ephedra*. Summer resident, a few may winter.

Tetraonidae (Grouse)

Dendragapus obscurus (Say). Blue Grouse. Presnall (1934), Grater (1947), and Russell and Thompson (1964) Bryce Canyon. Permanent resident.

Centrocerus urophasianus urophasianus (Bonaparte). Sage Grouse. Russell and Thompson (1964) Bryce Canyon. Permanent resident.

Phasianidae (Chukars, Pheasants, and Quail)

Lophortyx gambelii gambelii Gambel. Gambel's Quail. Hayward et al. (1958) Calf Creek area; BYU (1971) one at Site 13, 15 Oct. (*Coleogyne*) and five birds in Cottonwood Wash; also specimen, 16 Dec. Uncommon permanent resident.

Phasianus colchicus Linnaeus. Ring-necked Pheasant. Behle et al. (1958) observed and heard in the fields around Escalante, 7 and 8 May 1954. Uncommon permanent resident near areas of cultivation.

Alectoris chukar (Gray). Chukar. BYU (1972) Cottonwood Wash. Sparse permanent resident.

Rallidae (Rails, Gallinules, and Coots)

Fulica americana Gmelin. American Coot. Woodbury and Russell (1945) below mouth of Bridge Canyon, 15 July 1936; Behle and Higgins (1959) river mile 47, flushed from *Sa-lia*, 30 July 1958; BYU (1971) on Wahweap Creek, three miles east of Glen Canyon City, 6 Nov. (*Tamarix* around pond); BYU (1973) Site 14, 29 May. Uncommon summer, spring, and fall resident.

Charadriidae (Plovers)

Charadrius vociferus vociferus Linnaeus. Killdeer. Woodbury and Russell (1945) one, Kaiparowits Plateau, 11 Aug. 1937 (pond, 7000 ft); Behle et al. (1958) confluence Calf Creek/Escalante River; BYU (1971) two, north of Church Wells, 28 Sept.; BYU (1972) two near Glen Canyon City, 14 July and two at Wahweap Creek, 13 June (*Tamarix*); BYU (1973) one at Coyote Creek, 5 June. Uncommon summer resident and spring and fall transient.

Scolopacidae (Sandpipers and Willet)

Actitis macularia (Linnaeus). Spotted Sandpiper. Woodbury and Russell (1945) one, Rock Creek/Colorado River, 20 July 1937 (3300 ft), and as reported from their unpublished field notes (Behle and Higgins 1959) they observed 17 individuals from river mile 44 to Lee's Ferry, 7-10 Aug. 1938; Behle and Higgins (1959) common along Colorado throughout Glen Canyon during summer of 1958 and nesting along many of the smaller streams; Behle et al. (1958) confluence Calf Creek/Escalante River; BYU (1973) one at Coyote Creek Pond, 5 June and 2 at junction Paria/Colorado Rivers, 6 June. Formerly a common summer resident, this species seemingly has declined in numbers since the construction of the Glen Canyon Dam and the filling of the reservoir.

Catoptrophorus semipalmatus inornatus (Brewster). Willet. Presnall (1937) Bryce Canyon; BYU (1972-1973) Four Mile Bench, no date. Sparse transient.

Calidris mauri (Cabanis). Western Sandpiper. Woodbury and Russell (1945) near Lee's Ferry, 11 Aug. 1938. Sparse transient.

Phalaropodidae (Phalaropes)

Steganopus tricolor Vieillot. Wilson's Phalarope. Woodbury and Russell 1945 specimen from flock on Kaiparowits Plateau, 2-3 Aug. 1938. Sparse fall transient.

Laridae (Gulls and Terns)

Larus californicus Lawrence. California Gull. BYU (1971) Warm Creek Bay, 8 Nov. BYU (1973) Lone Rock Bay, 8 Aug. Sparse fall transient.

Larus delawarensis Ord. Ring billed Gull. Behle (1945) three at Last Chance Creek and again at the mouth of Kane Creek, on the Colorado River. Sparse spring transient.

Columbidae (Doves and Pigeons)

Columba fasciata fasciata Say. Band tailed Pigeon. Benson (1935) Navajo Mountain; Behle et al. (1958) Bryce Canyon. Summer resident.

Zenaida macroura (Linnaeus). Mourning Dove. Presnall (1934) Bryce Canyon. Benson (1935) Navajo Mountain; Tanner (1940a) Escalante River drainage; Woodbury and Russell (1945) Rock Creek, 24-26 July, Kaiparowits Plateau, 3 Aug. 1937; and War God Springs at Navajo Mountain, 16 Aug. 1935, common breeder up to 9000 ft elevation on Navajo Mountain; Behle et al. 1958, confluence of Calf Creek/Escalante River; Behle (1960) abundant Coyote Gulch (Whitney) north side of Kaiparowits Plateau, Davis Gulch, and along Escalante River 55 miles southeast of Escalante, Aug. 1957. Behle and Higgins (1959) abundant in Glen Canyon summer 1958; BYU (1971-1973) specimen one mile west Site 2 on 23 July 1971. Sites 1, 6, 10, 13, 14, 19, 28, 30, and 34. Glen Canyon City, Cannonville, Cottonwood Wash, Grosvenor Arch, Tibbet Spring, Lee's Ferry, Nipple Creek, Wahweap Creek, Warm Creek, Driftwood Canyon, and Three Garden one mile above confluence of San Juan with Lake Powell. During the April and May migration period most Mourning Doves were encountered in washbottoms, 102, 5 were seen in grasslands, 14 in desert shrub, and 4 were distributed more evenly among various vegetational types, in contrast during fall

migration fewest were seen in washbottoms. For example, 24 were seen in grasslands, 22 on desert shrubs, 21 in *Populus*, 12 in *Tamarix*, 15 in woodland, 6 in hanging gardens, 3 in open fields, 2 in rocks, and 2 in washbottoms. In August–November grasslands were most used where 39 individuals were seen, followed by desert shrubs (27) and woodland (2). This species was sighted 155 times with 1335 individuals recorded. The earliest spring record was 15 Apr. (1972) and the latest fall record was 1 Nov. (1973). The peak of spring and fall passage through the area was in May and in August, respectively. The monthly totals for 1972 and 1973 combined are as follows: Apr. (29), May (121), June (72), July (68), Aug. (463), Sept. (109), Oct. (197), and Nov. (2). Abundant summer resident.

Strigidae (Typical Owls)

Otus asio (Linnaeus). Screech Owl. Russell and Thompson (1964) Bryce Canyon. Permanent resident.

Otus flammeolus (Kaup). Flammulated Owl. Woodbury (1939) indicates that during July 1936 H. N. Russell, Jr., collected a specimen in *Salix* near War God Spring on Navajo Mountain, 6 July 1936. Others were seen or heard calling from 6, 12, 20, and 21 July; they made additional observations at Beaver Creek, eight miles north of Navajo Mountain, 8 and 9 Aug. Resident, breeding in *Pinus ponderosa* and pygmy conifers.

Bubo virginianus pallescens Stone. Great Horned Owl. Presnall (1934) and Behle et al. (1958) Bryce Canyon; Woodbury and Russell (1945) Navajo Mountain at 9000 ft; BYU (1971–1973) specimen: Site 1, near Glen Canyon City, 29 Aug. 1971; Site 1, 16 Feb. 1972 (grasslands); Tibbet Spring, 15 Apr. 1972 (*Populus fremontii*, washbottom); BYU (1973) Four Mile Bench, 13 May. Permanent resident.

Glaucidium gnoma californicum Sclater. Pygmy Owl. Russell and Thompson (1964) Bryce Canyon. Permanent resident.

Athene cunicularia hypugaea (Bonaparte). Burrowing Owl. Phillips et al. (1964) southeast portion of the Kaiparowits Basin; BYU (1972) Cottonwood Wash, 9 Aug. (grassland); five miles west of Glen Canyon City, 4 June and 21 July; four miles west of Glen Canyon

City (*Artemisia filifolia*) sitting in burrow on side of road; U.S. 89/Cottonwood Wash Road, 22 and 23 July; BYU (1973) three to four miles west of Glen Canyon City, 5 June (open grassland) nest under construction nearby; BYU (1974) Utah/Arizona state line north of Page on U.S. 89. Uncommon summer resident.

Strix occidentalis lucida (Nelson). Spotted Owl. Woodbury (1939) reported that this species was collected 13 Aug. 1936 in Navajo Canyon by H. N. Russell, Jr.; Behle (1960) Davis Gulch, a tributary of the Escalante River, 55 miles southeast of Escalante, Aug. 1957; two were seen several times in a small side canyon of Glen Canyon near river mile 101, 17 July, and another at the mouth of the Escalante River, 19 July 1958. Uncommon permanent resident.

Asio otus (Linnaeus). Long-eared Owl. BYU (1973) Site 30, 9 June (grassland). Permanent resident.

Caprimulgidae (Goatsuckers)

Phalaenoptilus nuttallii nuttallii (Audubon). Poorwill. Woodbury and Russell (1945) Navajo Mountain Trading Post, 22 July 1936, and Kaiparowits Plateau, 29 July and 3 Aug. 1937 (all in pygmy conifers); common in Aug. On Navajo Mountain, nests were found containing two downy young 23 July 1936 in pygmy conifers, a family of three poorly feathered juveniles in pygmy forest, Kaiparowits Plateau, 7000 ft, 29 July 1937, and similar family on 3 Aug. not far away in *Artemisia-Quercus*; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Paria Plateau, 29 Sept.; BYU (no dates) Site 3 and Church Wells. A recent decline in numbers is evidenced by the paucity of sightings in the present study as compared to the relative abundance of the species in earlier studies. Uncommon summer resident.

Chordeiles minor henryi Cassin. Common Nighthawk. Presnall (1934) Bryce Point; Benson (1935) Navajo Mountain; Tanner (1940a) Escalante drainage; Woodbury and Russell (1945) top Navajo Mountain, 14 July 1936; BYU (1971–1973) Sites 2, 3, 4, and 28; Glen Canyon Dam; one mile west, six miles east, and 2.5 miles southwest of Grosvenor Arch; and Four Mile Bench. Nighthawks were seen

as early as 19 May (1972) and as late as 5 Oct. (1972). Monthly distribution of observations during our study is one in May, 8 in June, 26 in July, 37 in Aug., none in Sept., and one in Oct. During June and July night-hawks were recorded in the following vegetation types and in the following numbers: *Coleogyne* (2), mixed shrub (1), *Grayia* (1), *Juniperus* (6), and grassland (7); from August on they were distributed as follows: *Coleogyne* (1), grass (35), *Juniperus* (9), and *Artemisia* (1). Common summer resident.

Apodidae (Swifts)

Aeronautes saxatalis saxatalis (Woodhouse). White-throated Swift. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) one, Kaiparowits Plateau, 27 July 1937 (7000 ft); Behle et al. (1958) Escalante River/Calf Creek; Hayward et al. (1958) Escalante drainage; Behle (1960) Coyote Gulch and Kaiparowits Plateau, Aug. 1957; Behle and Higgins (1959) give numerous observations for lower Glen Canyon from the field notes of Woodbury and Russell. In these notes a colony of swifts was observed in a crevice of a cliff at the mouth of Rock Creek, 20–26 July 1937; six at mile 2 on the San Juan River, 1 Aug. 1938, and others were seen between miles 41 and 25, 8 Aug., and at mile 25, 9 Aug. BYU (1971–1973) Sites 1, 2, 3, 4, 10, and 23, Cottonwood Wash, Hackberry Canyon, Lee's Ferry, Kelly Grade, Tibbet Spring, Wiregrass Spring, Reflection Canyon, Ribbon Canyon, and Three Garden one mile above San Juan confluence with Lake Powell. Although most swifts were seen near cliffs, those migrating were seen away from cliffs and over various kinds of vegetation, including *Coleogyne*, grass, *Grayia*, woodland, and *Tamarix*. Where cliffs were near rivers or streams they were seen above riparian streamside. In 1972 the earliest spring sighting was 28 Apr.; in 1973 it was 1 May. The latest fall sighting was 8 Aug. in 1972, when 150 birds were seen. Sightings in April and August contain large numbers of swifts (50–150). In May and June they were usually seen singly or in twos or threes; 9 were seen in one flock. In July they were seen mostly in groups containing

many birds. In early July some sightings contained 1, 2, 5, and 10 birds. From 1971–1973 the species was sighted 37 times and 324 individuals were recorded. Common summer resident.

Trochilidae (Hummingbirds)

Archilochus alexandri (Bourcier & Mul-sant). Black-chinned Hummingbird. Presnall (1934) Bryce Canyon; Benson (1935) one, Navajo Mountain; Woodbury and Russell (1945) one, Navajo Mountain, 9 July 1936 (*Pinus ponderosa*) and seen on the Kaiparowits Plateau; Behle et al. (1958) nest with eggs confluence of Calf Creek/Escalante River; Behle (1960) Kaiparowits Plateau, Aug. 1957; BYU (1972) Three Garden, 25 June. Summer resident.

Selasphorus platycercus platycercus (Swainson). Broad-tailed Hummingbird. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) three, Navajo Mountain, 17 July 1936 (*Populus tremuloides*), 9 Aug. 1935 (*Pinus ponderosa*, 8,500–10,500 ft), and Kaiparowits Plateau, 1 Aug. 1937 (deciduous shrub, 7000 ft); Behle (1948) Aztec Creek; Behle et al. (1958) confluence of Calf Creek/Escalante River; Hayward et al. (1958) Calf Creek area; Behle and Higgins (1959) Aztec Creek, 26 July 1958; BYU (1972) Reflection Canyon and Three Garden. Summer resident; the species is likely more common than these few sightings suggest because a number of hummingbirds were not identified and others were misidentified.

Selasphorus rufus (Gmelin). Rufous Hummingbird. Woodbury and Russell (1945) the Nelson and Birdseye trip noted the species from Fort Defiance to Lee's Ferry; Woodbury and Russell (1945) four, Navajo Mountain, 9 Aug. 1935, and 11–17 July 1936, *ponderosa* zone, 7000–10,400 ft; Russell and Thompson (1964) Bryce Canyon; Woodbury and Russell (1945) found it mostly at altitudes above 5300 feet. Summer resident.

Stellula calliope (Gould). Calliope Hummingbird. Behle et al. (1958) five miles northwest of Escalante; Behle (1960) one mile up Aztec Creek from river mile 68.5, 26 July

1958 (believed to be this species). Sparse migrant.

Alcedinidae (Kingfishers)

Megaceryle alcyon (Linnaeus). Belted Kingfisher. Behle (1960) one seen at the Crossing-of-the-Fathers (mouth of Kane Creek); river mile 41, by Clayton White, 2 Apr. 1954. Permanent resident, more common in summer.

Picidae (Woodpeckers)

Colaptes auratus cafer (Linnaeus). Red-shafted Flicker. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) Navajo Mountain, 5 Aug. 1934, 10 Aug. 1935, and 22 July 1936 (6700–9500 ft including pygmy forest, *Pinus ponderosa*, and *Picea-Abies* zones; most commonly observed from 1 Mar. to 31 Oct.); Behle et al. (1958) eight miles south of Escalante, 20 Sept. 1935; BYU (1971) two specimens: Site 1, 9 and 15 Oct.; lower Cedar Mountain, 7 Oct. (woodland); BYU (1972) Site 2, one seen 11 Apr. (*Juniperus*); one mile east of Glen Canyon City, 28 Jan. (woodland); Cottonwood Wash, 29 Sept. (washbottom); BYU (1973) Site 28, 13 June (*Juniperus*); Four Mile Bench; Lee's Ferry; Wiregrass Spring; and Tibbet Spring, 8 Feb. (washbottom). Permanent resident, uncommon.

Melanerpes lewis (Gray). Lewis' Woodpecker. Presnall (1934) Bryce Canyon. Summer resident.

Sphyrapicus varius (Linnaeus). Yellow-bellied Sapsucker. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Woodbury and Russell (1945) one, Navajo Mountain, 23 July 1936, with other observations, 11–23 July; BYU (1971) Nipple Spring, 15 Oct. (riparian woodland); Site 12; specimen: Site 15, 9 Oct. Summer resident and migrant.

Sphyrapicus thyroideus (Cassin). Williamson's Sapsucker. Presnall (1934) and Behle et al. (1958) Bryce Canyon. Summer resident.

Picoides villosus leucothorectis (Oberholser). Hairy Woodpecker. Presnall (1934) Bryce Canyon; Benson (1935) three, Navajo Mountain; Behle et al. (1958) confluence of Calf Creek/Escalante River; Woodbury and

Russell (1945) three, Navajo Mountain, 18 Aug. 1935; six, 16 July 1936 (*Picea-Abies* and *Pinus ponderosa* between 8500–10,000 ft); this expedition had nearly 50 records, chiefly from Navajo Mountain, distributed through June, July, and August. Summer resident.

Picoides pubescens leucurus (Hartlaub). Downy Woodpecker. Long (1937), Grater (1947), and Russell and Thompson (1964) Bryce Canyon. Summer resident, descending to river bottoms in winter (Behle 1960).

Tyrannidae (Tyrant Flycatchers)

Tyrannus verticalis Say. Western Kingbird. Woodbury and Russell (1945) the Nelson and Birdseye trip recorded a few at Lee's Ferry, 23–24 Aug. 1909; Woodbury and Russell (1945) two, Rock Creek/Colorado River, 22 July 1937 (streamside trees, 3300 ft); Kaiparowits Plateau, 13 Aug. 1937 (*Salix*, 8000 ft); Hayward et al. (1958) Escalante drainage; Behle and Higgins (1959) several sightings in lower Glen Canyon, early Aug. 1938; Behle and Higgins (1959) field notes of Woodbury and Russell for 1938, give the observation of eight kingbirds on Colorado River between miles 63 and 2½ miles below Lee's Ferry, 5–11 Aug.; BYU (1971) Site 3, 13 July; BYU (1972) Site 1, 3 Aug. (*Juniperus*); between Sites 1 and 2, 3 June (*Juniperus*); Site 3, 3 June (grass), Site 2, two seen 4 June (*Juniperus*); Site 21, 24 June (woodland); BYU (1973) Site 12, 9 May; Nipple Bench, 1 Aug.; and Tibbet Spring, 16 June (*Populus-Tamarix*); Glen Canyon City, 28 Apr.; Cottonwood Wash, 5 June (*Tamarix*); and Paria River/U.S. 89, three seen 6 June (stand of *Populus*). Earliest spring date, 28 Apr. (1973); latest fall date, 3 Aug. (1972). Common summer resident.

Tyrannus vociferans vociferans Swainson. Cassin's Kingbird. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Woodbury and Russell (1945) two, Kaiparowits Plateau, 13 Aug. 1937 (chaparral at 7000 ft) and Rock Creek/Colorado River, 26 July 1937 (*Quercus* at 3300 ft); Behle et al. (1958) one, 10 miles south of Escalante, 9 May 1937; Behle (1960) frequently seen in side canyons of Glen Canyon, 1 July to 9 Aug. 1958; BYU (1973) Site 3, three believed to be this species seen 6 Aug.; Cottonwood Wash, two mated

pairs seen each day, 5 and 6 June (*Populus*); Paria River/U.S. Highway 89 and Lee's Ferry, two seen each day, 6 and 7 June (*Populus-Salix-Tamarix*). Summer resident.

Myiarchus tyrannulus (Muller). Wied's Crested Flycatcher. BYU (1973) this rare species was seen in semiarid grassland several times at Site 3 by Clyde Pritchett between 1 and 9 Aug.; two were seen 1 Aug., three on 3 Aug., one on 4 Aug., three on 6 Aug., and two on 9 Aug. Behle and Perry (1975) report this species as a rare summer resident only in extreme southwestern Utah. Hayward et al. (1976) cite only those records given by Behle and Perry. Thus, Pritchett's observations seemingly extend the range of this species to southeastern Utah. Sparse migrant.

Myiarchus cinerascens cinerascens (Lawrence). Ash-throated Flycatcher. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) five, Rock Creek/Colorado River, 21–26 July 1937 (canyon shrubs, 3300 ft) and three miles north Navajo Mountain Trading Post, 12 July 1934 and 27 July 1936 (pygmy forest, 6000 ft); Behle et al. (1958) 10 miles south of Escalante, 9 May 1937, and confluence of Calf Creek/Escalante River; Behle and Higgins (1959) give at least 13 observations from Woodbury and Russell's field notes for the Colorado River between river mile 75 and ½ mile below Lee's Ferry, 3–10 Aug. 1938; Higgins (Behle and Higgins 1959) found this flycatcher to be very abundant along the length of Glen Canyon and side canyons, 1 July to 9 Aug. 1958; Behle (1960) junction Colorado and Escalante Rivers, river mile 88, 19 July 1958; BYU (1972) Site 1, 27 June and 31 July (*Atriplex*); Reflection Canyon, 4 July (washbottom); Three Garden, 3 July (Hanging Garden); confluence of San Juan/Colorado Rivers, 24 June; BYU (1973) 8 miles north of U.S. 89 on Cottonwood Wash road, 5 June (possibly nesting in *Tamarix*); 13 miles north U.S. Highway 89 on Cottonwood Wash road, 8 June (*Populus*); Brigham Plains Road, 8 June (*Populus*); Cow Camp on Four Mile Bench, 13 June; Hackberry Canyon, 8 June (scattered brush); 2.5 miles north Lee's Ferry, 14 June (scattered brush); Paria River (1 mile south of Paria), 7 June (dense *Salix*); Tibbet Spring, three seen 5 June (open shrubs

and *Populus*); and Wiregrass Spring, two seen 5 June (*Tamarix*). Common summer resident.

Sayornis nigricans (Swainson). Black Phoebe. Woodbury and Russell (1945) Lee's Ferry, observed by E. W. Nelson, 23–26 Aug. 1909; Phillips et al. (1964) south central portion of the Kaiparowits Basin. Occasional migrant or summer resident.

Sayornis saya saya (Bonaparte). Say's Phoebe. Benson (1935) Navajo Mountain, 21–24 June 1933; Tanner (1940a) Escalante drainage; Woodbury and Russell (1945) seven, Navajo Mountain, 13 Aug. 1935; Warm Creek, 16 July 1936; Rock Creek, 21 July 1937; Kaiparowits Plateau, 4 Aug. 1937; Navajo Mountain Trading Post, 27 July 1936 (pygmy forest, *Salix*, desert brush, *Populus tremuloides*, and *Salix*, 3190–9000 ft); Behle et al. (1958) Escalante drainage; Behle and Higgins (1959) three, Colorado/Escalante River, 19 July 1958; common all along Glen Canyon, summer 1958; they believed this taxon nested in cliffs and larger trees; one in Warm Creek Canyon, 18 Oct. 1958 (*Salix*, *Tamarix*, *Baccharis*, and *Pluchea*); in addition, Behle and Higgins (1959) reported from the Rainbow Bridge-Monument Valley expedition field notes, common along Colorado River and tributaries, 4–22 July 1938, and over 29 seen between mile 75 and ½ mile below Lee's Ferry, 4–11 Aug. 1938; Russell and Thompson (1964) Bryce Canyon; BYU (1961) specimen (male): Paria, 20 May; BYU (1971–1973) one mile south Site 2, 28 Aug. 1971; Sites 3, 7, 12, 13, and 23, Church Wells, Cottonwood Wash at miles 5, 8, and 11 north of U.S. Highway 89, Paria River, and Nipple Spring; one, four miles north of Church Wells. Phoebes were sighted 13 times (17 individuals) at 10 localities. Habitat in which phoebes were seen, based on only six of 13 sightings, consisted of a rocky cliff, rocky areas, scattered brush, *Chrysothamnus*, and *Populus*. The earliest spring date was 5 June (1973). The latest fall observation was 30 Sept. (1971). Common summer resident.

Empidonax traillii (Audubon). Willow Flycatcher. Woodbury and Russell (1945) five, Navajo Mountain, 26 July 1936; Kaiparowits Plateau, 3 Aug. 1937; Lee's Ferry (nest), 11 Aug. 1938, and 25 Aug. 1909; and two miles below San Juan/Colorado Rivers, 3 Aug. 1938 (*Salix*, *Tamarix*, and *Quercus*,

3200–7000 ft); Phillips et al. (1964) south central portion of the Kaiparowits Basin; Higgins (Behle 1960) considered this species common to stands of *Salix*, *Tamarix*, *Baccharis*, and *Pluchea* along Colorado River in Glen Canyon, summer 1958; Woodbury and Russell (1945) considered it primarily as a bird of streamside thickets; BYU (1973) Hackberry Canyon, 8 June, male displaying (*Tamarix*); Lee's Ferry, 7, 14, 15 June, singing (*Tamarix* with *Salix*); and Paria/Colorado Rivers, 7 and 14 June (dense *Salix* and *Tamarix*). Summer resident.

***Empidonax oberholseri* Phillips.** Dusky Flycatcher. Woodbury and Russell (1945) several, Kaiparowits Plateau, 31 July; 6 Aug. 1937 (also female seen with three half-grown nestlings); and 13 Aug. 1936 (nest in *Quercus*); BYU (1973) one (female), Tibbet Spring, 2 May. Summer resident.

***Empidonax wrightii* Baird.** Gray Flycatcher. Woodbury and Russell (1945) one, Navajo Mountain Trading Post, 26 July 1936 (pygmy conifers, 6500 ft); BYU (1973) two, female, two miles east Glen Canyon City, 29 Apr. and male, Tibbet Spring, May. Summer resident.

***Empidonax difficilis hellmayri* Brodkorb.** Western Flycatcher. Woodbury and Russell (1945) Beaver Creek/Navajo Mountain area, 7 Aug. 1936 (*Quercus*, 6000 ft); Behle and Higgins (1959) one, Kane Creek/Colorado River, 2 Aug. 1958. Summer resident.

***Contopus sordidulus veliei* Coues.** Western Wood Pewee. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) two, Navajo Mountain, 12 Aug. 1935 and 13 Aug. 1936 (*Pinus ponderosa*, 8500–9000 ft); Hayward et al. (1958) Escalante drainage; BYU (1971) Site 4 (Paria Narrows), 30 Sept. Uncommon summer resident and migrant.

***Nuttallornis borealis* (Swainson).** Olive-sided Flycatcher. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) several, Beaver Creek/Navajo Mountain area, 6 and 9 Aug. 1936, and War God Spring on Navajo Mountain, 13 Aug. 1935; seen near Lee's Ferry, 10 Aug. 1938; six birds observed at War God Spring, 13 Aug. 1937 (*Pinus ponderosa*, 6500–9000 ft); Behle and Higgins (1959) seen at river mile 3.5 and ½ mile below Lee's Ferry; and BYU (1961) one, Paria, Utah, 20 May. Summer resident.

Alaudidae (Larks)

***Eremophila alpestris leucolaema* Coues.** Horned Lark. Behle et al. (1958) 10 miles southeast of Escalante, 8 May 1954; Russell and Thompson (1964) Bryce Canyon; Behle and Higgins (1959) Higgins saw flock near mouth Kane Creek, river mile 40, 2 Aug. 1958; one, between Warm and Wahweap Creeks, 25 March 1958 (3800 ft); BYU (1971–1974) 4, (males) T 43S R2W S24, near tank, 7 Dec. 1971; Sites 1, 3, 10, 12, 13, 15, and 23; Warm Creek; Church Wells; Cottonwood Wash; Smoky Mountain; and Tibbet Canyon; Summit Navajo Mountain; Escalante Valley/Little Valley Road; three miles north U.S. Highway 89 on Cottonwood Wash Road. A total of 1639 larks or sightings were seen during the study, at over 20 locations and from 97 sightings. A number of sightings were recorded as many or common. The species is decidedly more frequent in the late fall/winter months, i.e., November through February, when at least 1220 were recorded. In March through June only 87 individuals were recorded, with only 3 in April and one in May. The numbers increased to 32 in June. In July and August they greatly increased (165 individuals plus five flocks containing many individuals). Only 11 were seen in September and 156 in October. A January flock contained 600 birds. The species shows a marked affinity for grasslands. During the nonbreeding season of September–April, 482 individuals were recorded in grassland vegetation, compared to 75 in desert shrubs and 15 in saltwash. In May and June, 4 were seen in grass and 18 in desert shrubs. In July and August, 45 (one flock) were seen in *Juniperus*/grass, and 12 in grass.

In April through June, Horned Larks were seen either singly (11 of 16 sightings), in pairs (2), or in small flocks containing 6 (2) or 8 (1) birds. They congregated into larger groups or flocks in July, half of which contained 10–15 birds; one, about 45 birds; one, 5 birds, and three, one bird each. Additionally, four flocks containing many birds were also encountered for which numbers were not obtained. As the season progressed the Horned Larks were seen in increasingly larger flocks. For example, from July through September the average number of birds per sighting was 9.6

range 1-45); for October and November it was 18.1 (range 10-30); and for December through March it was 53.2 (range 1-600). During the non-nesting season, July through March, only 7 larks were seen singly, and only one sighting each contained 2 and 3 birds; five contained 4 birds; three, 5 birds; two, 6 birds; one, 7 birds; two, 9 birds, seven, 10 birds; eight, 20 birds; one, 23 birds; one, 45 birds; four, 30 bird; three, 50 birds; two, 100 birds; and one, 600 birds. Additionally, there were five flocks for which no count was made. Common year-round resident of the area.

Hirundinidae (Swallows)

Tachycineta thalassina lepida Mearns. Violet-green Swallow. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) one, four miles north of Navajo Mountain Trading Post, 27 July 1936 (pygmy conifers, 6000 ft) and nest found in old woodpecker hole, Navajo Mountain; Behle (1948) Aztec Creek; Behle et al. (1958) confluence Calf Creek/Escalante River, 1954; Behle and Higgins (1959) Rainbow Bridge-Monument Valley expedition field notes, seen frequently along Colorado River, 14-22 July; over 28 seen from river mile 69 to river mile 41, 4-8 Aug. 1938; seen frequently throughout Glen Canyon; Phillips et al. (1964) eastern part of the Kaiparowits Basin; BYU (1972) Site 30, 23 July; Cedar Mountain, 31 July (*Ephedra*); Site 20, 21 July; Site 16, 2 June (*Tamarix*); Cottonwood Wash, 26 June (*Populus*); Nipple Bench, 1 Aug.; San Juan/Colorado Rivers, 24 June; Tibbet Spring, 17 June (*Tamarix*); Four Mile Bench, 18 June (*Artemisia*); BYU (1973) Lee's Ferry, 15 June; 7 at Paria/Colorado Rivers, 14 June (*Tamarix*); Site 7, 4 July; Site 14, 10 May; near Site 28, 13 June (*Juniperus*/grass); and Site 34, 5 June (open brush). Summer resident.

Iridoprocne bicolor (Vieillot). Tree Swallow. BYU (1973) Lee's Ferry, one seen 6 June. Sparse migrant.

Riparia riparia riparia (Linnaeus). Bank Swallow. Russell and Thompson (1964) Bryce Canyon. Summer resident.

Stelgidopteryx ruficollis (Vieillot). Rough-winged Swallow. Woodbury and Russell

(1945) specimens at river mile 63, 4 Aug. 1938 and Lee's Ferry, 23-26 Aug. 1909; Behle and Higgins (1959) Woodbury and Russell's field notes from 1938, six observed between San Juan/Colorado Rivers and five miles up the San Juan, 2 Aug.; nine seen along the Colorado River, 3-4 Aug.; BYU (1971) Wahweap Creek, 10 Aug.; BYU (1973) Paria/Colorado Rivers, two seen in *Tamarix*, 14 June. Summer resident.

Petrochelidon pyrrhonota pyrrhonota (Vieillot). Cliff Swallow. Presnall (1934) Bryce Canyon; Tanner (1940a) Kaiparowits Basin; Behle et al. (1958) confluence Calf Creek/Escalante River; Hayward et al. (1958) Escalante drainage; Behle and Higgins (1959) Higgins found it common in Glen Canyon, nests seen attached high canyon walls, July 1958; BYU (1973) Site 13, 11 June; Site 30 nine seen, 8 June (nesting in rocks and *Juniperus*); Nipple Spring, 12 June; and Tibbet Spring, 10 June. Fairly common summer resident.

Corvidae (Jays, Magpies, Ravens, and Nutcrackers)

Perisoreus canadensis capitalis (Ridgway). Gray Jay. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon. Permanent resident.

Cyanocitta stelleri macrolopha Baird. Steller's Jay. Presnall (1934) Bryce Canyon; Benson (1935) four, Navajo Mountain, 13-20 July 1933; Woodbury and Russell (1945) several, Navajo Mountain, 13 July 1933, 12 Aug. 1935, 10 July and 10 Aug. 1936, (numerous in *Pinus ponderosa*, 9000 ft); Grater (1947) and Russell and Thompson (1964) Bryce Canyon. Permanent resident.

Aphelocoma coerulescens woodhouseii (Baird). Scrub Jay. Benson (1935) Navajo Mountain area; Long (1937) and Russell and Thompson (1964) Bryce Canyon; Woodbury and Russell (1945) four, Navajo Mountain, 2 and 25 July 1936 and Kaiparowits Plateau, 21 and 31 July 1937 (*Pinus ponderosa*, *Populus tremuloides*, pygmy conifers, and *Amelanchier*, 6500-8500 ft); Tanner (1940a) Kaiparowits Basin; Behle et al. (1958) Calf Creek/Escalante River; Hayward et al. (1958) Escalante drainage; BYU (1971) 1/2

mile south Site 1; BYU (1972) one mile south Glen Canyon City. Permanent resident.

Pica pica hudsonia (Sabine). Black-billed Magpie. Russell and Thompson (1964) Bryce Canyon; BYU (1971) near Nipple Spring, 16 Oct. (riparian) and Wahweap Creek, four seen 18 Dec. (*Tamarix*); BYU (1972) Wahweap Creek, four seen 17 Jan. (salt wash) and Glen Canyon City, 13 Feb. (city dump). The magpie seemingly is absent during the spring and summer, with a few moving into the area during fall and winter.

Corvus corax sinuatus Wagler. Common Raven. Presnall (1934) Bryce Canyon; Benson (1935) one, Navajo Mountain; Woodbury and Russell (1945) up to 10,000 feet elevation on Navajo Mountain; Behle (1948) river mile 31; Behle et al. (1958) 10 miles south of Escalante, 8 May 1954; BYU (1971–1973) Sites 1, 2, 3, 4, 5, 10, 11, 19, 20, 21, and 22, Page, Cottonwood Wash, Buckskin Gulch, Warm Creek, Church Wells, Grand Bench, Grosvenor Arch, Smoky Mountain, Tibbet Canyon, Wahweap Creek, Driftwood Canyon, San Juan/Colorado Rivers, Reflection Canyon, Lee's Ferry, Three Garden, one mile above confluence of San Juan River and Lake Powell, and east of Lone Rock/Lake Powell. Sight records are distributed throughout every month of the year. The greatest number of individuals was seen during December (85) and February (97) and the least during January (6), April (7), and May (10). A total of 407 individuals were counted during the study. Of 164 sightings of ravens, 82 (50 percent) of them were of single birds, 43 (26 percent) were of pairs, 11 (7 percent) of triples, and 15 (9 percent) were quadruples. Four sightings contained 5 birds and four, 6 birds, and one each consisted of flocks containing 7, 10, 25, and 60. The flocks containing 25 and 60 birds were at city dumps. Ravens were seen in all vegetational types, but the observations were not distributed evenly among them; of 178 individuals 57 percent were seen in grasslands and 25 percent were seen in desert shrubs. The remaining 32 birds were seen in *Juniperus* (5 percent), washbottoms (4 percent), *Populus* (1 percent) and miscellaneous situations (8 percent). Ninety-eight additional ravens were seen at city dumps. Permanent resident.

Gymnorhinus cyanocephalus Wied. Pinyon Jay. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) three, Kaiparowits Plateau, 2 and 3 Aug. 1937, and Navajo Mountain Trading Post, 31 July 1936 (pygmy forest, 6500–7000 ft); Woodbury encountered a flock of 100 birds on Kaiparowits Plateau, 4 Aug. 1937; Behle et al. (1958) eight miles south of Escalante, 19 Sept. 1935; Hayward et al. (1958) Escalante drainage; BYU (1971–1973) Sites 1, 2, 3, 4, 14, 21, 27, 28, 29, and 30; Cannonville; Tibbet Spring; and Cottonwood Wash; Paria Plateau, 29 Sept.; lower Cedar Mountain; five miles west Site 27. Pinyon Jays were recorded every month of the year with the largest numbers in Aug. (310). Numbers observed monthly were as follows: 5 were seen in Sept., 14 in Oct., 6 in Nov., 16 in Dec., 3 in Jan., 35 in Feb., 31 in Mar., 22 in Apr., 8 plus one flock in May, 14 plus one flock in June, and 39 in July. A total of 503 individuals (plus two flocks uncounted) were seen from 1971 to February 1974. Most sightings (25) and individuals (254) where vegetational type was recorded were in pygmy conifers. Six sightings and 16 individuals were in desert shrubs consisting of *Coleogyne*, mixed grass-shrubs, *Grayia*-grass, and *Artemisia*. A sighting of 30 individuals was in reseeded grass. Fourteen of the 52 sightings were of single birds; 4 were of doubles; 6 contained 3 to 5 birds; 8, 6 to 10 birds; 3, 15 birds; 2 each, 20 and 30 birds; and one each consisted of 16, 17, 35, 37, and 100 birds. Permanent resident.

Nucifraga columbiana (Wilson). Clark's Nutcracker. Presnall (1934) Bryce Canyon; Benson (1935) specimen: Navajo Mountain/Bridge Canyon, 13 July 1933 (seen everyday in mid-June 1933); Woodbury and Russell (1945) six specimens: Navajo Mountain, July 1936–37; Colorado River side canyon next below Bridge Canyon, 13 July 1936 (*Populus*, *Pinus ponderosa*, and *Picea-Abies* forest from 3200 to 10,000 ft); BYU (1971) in *Picea-Abies* at summit Navajo Mountain, 13 Oct. Permanent resident higher mountains, moves lower after nesting.

Paridae (Bushtits, Chickadees, and Titmice)

Parus atricapillus garrinus Behle. Black-capped Chickadee. Russell and Thompson

(1964) Bryce Canyon; Presnall (1934) also reported *P. a. septentrionalis* in Bryce Canyon. However, Behle et al. (1958) and Behle and Perry (1975) place the area of Utah just west of the Kaiparowits Plateau in a zone of integration between *P. a. nevadensis* of western Utah and *P. a. garrinus* of extreme eastern Utah. Permanent resident.

Parus gambeli Ridgway. Mountain Chickadee. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) three at Kaiparowits Plateau, 5–6 and 12 Aug. 1937, and one at Navajo Mountain, 10 July 1936 (*Populus tremuloides*, *Pinus ponderosa*, and pygmy conifers, 7000–9500 ft); BYU (1971) Lake Powell/Warm Creek inlet, 8 Nov. and summit of Navajo Mountain, 12 Oct. Behle (1960) described the race *wasatchensis*, which included the population of the Kaiparowits Basin. Hayward et al. (1976) follow Snow (1967a), who considers *wasatchensis* to be a synonym of *inyoensis*. Permanent resident of mountains, moves lower in winter.

Parus inornatus ridgwayi Richmond. Plain Titmouse. Behle et al. (1958) confluence of Calf Creek/Escalante River; Russell and Thompson (1964) Bryce Canyon; BYU (1971) specimen: Paria Plateau, 29 Sept.; BYU (1972) Sites 3 and 21, 25 June (pygmy conifers) and Navajo Mountain. *P. i. griseus* which is now a synonym of *P. i. ridgwayi* was listed by Presnall (1934) for Bryce Canyon and collected by Woodbury and Russell (1945) four, Kaiparowits Plateau, 31 July 1937 and the Navajo Mountain area, 26 July 1936 (pygmy conifers, 6500–7000 ft). This species should be more common in the pygmy conifers than our few observations suggest. Woodbury and Russell (1945) reported it in pygmy conifers every month of the year; they considered it a permanent resident.

Psaltirparus minimum (Townsend). Common Bushtit. Long (1937) and Russell and Thompson (1964) Bryce Canyon; Woodbury and Russell (1945) six, Kaiparowits Plateau, 1 Aug. 1937, and Navajo Mountain, 8, 24, and 31 July 1936 and 14 Aug. 1937; Hayward et al. (1958) benches of the Escalante drainage; BYU (1971) one, T43S, R2W Sec 24, 7 Dec.; Site 2, 30 seen 7 Dec. (woodland); also seen in Tibbet Canyon, 11 Dec. (*Chrysothamnus*). Permanent resident. This taxon is placed in *Aegithalidae* by Snow (1967b).

Sittidae (Nuthatches)

Sitta carolinensis nelsoni Mearns. White-breasted Nuthatch. Presnall (1933, 1934, and 1936) and Russell and Thompson (1964) Bryce Canyon; Benson (1935) three, Navajo Mountain, 13 Aug. 1935 (mixed coniferous forest, 9000 ft). Woodbury and Russell (1945) found this species a regular, but not abundant, inhabitant of the pygmy forest, *Pinus ponderosa* zone, and more sparingly in the *Picea-Abies* forests. Permanent resident.

Sitta canadensis Linnaeus. Red-breasted Nuthatch. Presnall (1934 and 1936) Bryce Canyon and Woodbury and Russell (1945) three, Navajo Mountain, 14 July 1936, and Kaiparowits Plateau, 11 Aug. 1937 (*Picea-Abies-Populus* zone at 7000–10,400 ft); saw one to six birds each day in *Picea-Abies* forest on Navajo Mountain, 6 and 13–18 July 1936. Woodbury and Russell (1945) believed that the species probably nests in *Picea-Abies* forest of mountain tops and canyon heads and spreads to other habitats following nesting season. Permanent resident.

Sitta pygmaea melanotis van Rossem. Pygmy Nuthatch. Presnall (1934) Bryce Canyon; Benson (1935) two, Navajo Mountain and observed daily; Woodbury and Russell (1945) three, Navajo Mountain, 11 Aug. 1935 and 10 and 21 July (*Pinus ponderosa*, 8000–8500 ft); very common and abundant in *Pinus ponderosa* forest, but not in *Picea-Abies* forest on Navajo Mountain, 1 July–13 Aug. 1936; adults feeding well-grown young, 4 July; Woodbury and Russell found it very abundant and primarily in the *Pinus ponderosa* zone, restricted to elevations between 7500–9820 ft. Permanent resident.

Certhiidae (Creepers)

Certhia familiaris Linnaeus. Brown Creeper. Presnall (1934) Bryce Rim; Woodbury and Russell (1945) one, Navajo Mountain, 12 Aug. 1935 (*Pinus ponderosa*, 9000 ft); seen at Navajo Mountain, 18 July 1933 (dense forest) and 6–13 July to 13 Aug. 1936 (*Picea-Abies* forest). Woodbury and Russell found it there during June, July, and August in the *Picea-Abies* forest with winter records at lower elevations. Permanent resident.

Cinclidae (Dippers)

Cinclus mexicanus unicolor Bonaparte. Dipper. Benson (1935) Bridge Canyon at northwest base of Navajo Mountain; Tanner (1940a) Kaiparowits Basin. Woodbury and Russell (1945) believed that the dipper did not occur on Navajo Mountain and that it had a definitely limited distribution in Navajo country; they gave sight records for Bridge Canyon, 6 July 1933; several records in 1934 and one record 7 Aug. 1935. Permanent resident.

Troglodytidae (Wrens)

Troglodytes aedon parkmanii Audubon. House Wren. Presnall (1934) Navajo Trail; Benson (1935) one, Navajo Mountain, 14 July, and seen daily in fallen *Pinus ponderosa*, July; Woodbury and Russell (1945) three, Navajo Mountain, 14 July 1933, 16 Aug. 1935, and 9 July 1936 (common in thickets of *Arctostaphylos*, *Ceanothus*, and *Rosa* under *Pinus ponderosa*, 8500–9000 ft); Tanner (1940a) Kaiparowits Basin. Summer resident.

Thryomanes bewickii eremophilus Oberholser. Bewick's Wren. Woodbury and Russell (1945) one, two miles north of Navajo Mountain Trading post, 27 July 1936 (pygmy conifers, 6500 ft); they reported its regular, though not abundant, occurrence in pygmy conifers on the lower slopes of Navajo Mountain from 22 June to 9 Aug., 1934–1938.

Catherpes mexicanus conspersus Ridgway. Canyon Wren. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) six, Lee's Ferry, 26 Aug. 1909 (Nelson and Birdseye trip) and 18 July 1936; Rock Creek/Colorado River, 21 July 1936; two miles north of Navajo Mountain Trading Post, 2 Aug. 1936; Navajo Mountain, 6 Aug. 1935 and 2 Aug. 1936 (in cliffs of some size, bearing cracks for nesting, 3100 ft to 10,000 ft); Behle (1948) Hidden Passage Canyon, Lee's Ferry, and mouth of Aztec Canyon; Behle et al. (1958) one, confluence Calf Creek/ Escalante River, 1954; Hayward et al. (1958) Escalante drainage; Behle and Higgins (1959) recorded a considerable number of individuals in the Glen Canyon and Navajo Mountain areas, 21–23 June and July 1933, 4–22 July 1936, and 3–10 Aug. 1938. In summer of 1958 they found the

species abundant along the full length of Glen Canyon; BYU (1971) Cockscomb Ridge; 29 Sept.: BYU (1972) mouth of Escalante River, 25 June (hanging garden); BYU (1973) Hackberry Canyon, 8 June (open cliffs); Paria River, 14 June (cliffs); Lee's Ferry eight seen 7, 14, and 15 June (rocks); Driftwood Canyon; Three Garden; and Paria/Colorado Rivers, 15 June (rocks). Permanent resident.

Salpinctes obsoletus obsoletus (Say). Rock Wren. Benson (1935) several seen, Navajo Mountain; Woodbury and Russell (1945) four, Navajo Mountain, 11 Aug. 1935 and 13 July 1936; above Lee's Ferry, 19 July 1936 (*Artemisia*, pygmy forest, *Artemisia-Arctostaphylos* under *Pinus ponderosa*, 3100–10,000 ft); seen at Kaiparowits Plateau and Beaver Creek/Navajo Mountain area, 8 Aug. 1936; Behle (1948) Lee's Ferry; Behle et al. (1958) Escalante River, 7 May 1954 and 10 miles south of Escalante, 8 May 1954; Hayward et al. (1958) Escalante drainage; Woodbury (in Behle and Higgins 1959) one on 23 July 1937, and 20 in August 1938 at Rock Creek, Last Chance Creek, Lee's Ferry, and various distances along the Colorado River from river mile 50 to river mile 18. Russell and Thompson (1964) Bryce Canyon; BYU (1958) one (male), Paria Basin, 9 June; BYU (1961) one (male), Paria, 20 May; BYU (1971) Sites 2 and 15; Church Wells area, 28 Sept.; Grand Bench, 9–10 Oct.; Cottonwood Wash; Hackberry Canyon; Lee's Ferry; Nipple Spring; Smoky Mountain; Tibbet Spring; Ribbon Canyon; and Cockscomb Ridge, 29 Sept.; BYU (1973) 82 wrens of this species were seen at 15 localities in June and July. The earliest spring record was 5 June 1973 with nesting on 8 June. The latest fall record was 10 Oct. 1971. The Rock Wren is nearly obligate to cliffs and rocks. Seventeen of the individuals observed were in rocks or cliffs and one in *Populus*. Summer resident, may winter sparingly (Woodbury and Russell 1945) in Kaiparowits Basin.

Mimidae (Mockingbirds and Thrashers)

Mimus polyglottos leucopterus (Vigors). Mockingbird. Benson (1935) Navajo Mountain area; Tanner (1940a) base Kaiparowits Plateau, June 1936; Woodbury and Russell (1945) one, five miles south Navajo Mountain

Trading Post, 30 July 1965 (*Artemisia*, 6500 ft); few seen at Lee's Ferry and flats south of Navajo Mountain; Behle et al. (1958) one, 10 miles south of Escalante, 8 May 1954 (fairly common); Higgins saw one in *Atriplex confertifolia* at mouth of Escalante Canyon, 19 July 1958; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Last Chance Wash, 25 Sept. (*Chrysothamnus*); BYU (1972) Site 27, 1 June (woodland); Cedar Mountain, 28 July (*Ephedra*-grass); Site 24, 28 June (shrubs); BYU (1973) near Site 1, 9 and 21 May (*Juniperus*); Site 2, 2 seen 30 April (shrubs) and 3 July (*Juniperus*); near Site 3, 28 May (woodland) and 2 July (grass); Cottonwood Wash, 5 June (riparian); Nipple Spring, 12 June (*Populus*); Tibbet Spring, 5 and 10 June (open brush); Site 34, 4 seen, 10 July; and between Sites 6 and 8 on Smoky Mountain, 20 were seen 24 July (*Grayia-Coleogyne*). Summer resident between 30 April and 25 September.

Dumetella carolinensis (Linnaeus). Gray Catbird. Woodbury and Russell (1945) Lee's Ferry, as recorded by the Nelson and Birdseye trip of 1909; Phillips et al. (1964) Lee's Ferry. Summer resident.

Toxostoma bendirei (Coues). Bendire's Thrasher. Woodbury (1939) near Escalante, 9 May 1937; Behle et al. (1958) give the locality of the aforementioned specimen as five miles south of Escalante; however, they did not observe this species at this site, 8 May 1954; Hayward (1967) Wahweap Creek, 20 May 1956; BYU (1971) Site 15, 25 Sept. (*Chrysothamnus*). Summer resident.

Euroscptes montanus (Townsend). Sage Thrasher. Woodbury and Russell (1945) one, Lee's Ferry, 26 Aug. 1909, as recorded by Nelson and Birdseye's trip of 1909; Behle et al. (1958) two miles south of Escalante, 9 May 1954, and common in Escalante Valley, May 1954; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Site 12, 15 Oct.; Site 14, 15 Oct.; Tibbet Spring, 13 Aug.; Site 15, 11 Oct.; and Grand Bench, 9 Oct. Uncommon migrant.

Turdidae (Thrushes, Solitaires, and Bluebirds)

Turdus migratorius propinquus Ridgway. Robin. Presnall (1933 and 1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) three, Navajo Moun-

tain, 21 July and 16 Aug. 1936, and Kaiparowits Plateau, 11 Aug. 1937 (*Pinus ponderosa*, 7000–9000 ft); Hayward et al. (1958) Escalante drainage; Behle and Higgins (1959) seen at many places in Glen Canyon; most abundant in large vegetation at mouths of side canyons; BYU (1972) Tibbet Canyon, 1 Aug. (*Coleogyne*); BYU (1973) two, Wahweap Lodge, 31 Jan. (grass); Woodbury and Russell (1945) consider Navajo Mountain and the Kaiparowits Plateau to be chief breeding area of this species in the Navajo country of Utah. They list a juvenile from Navajo Mountain taken 16 Aug. 1936. Summer resident, a few apparently winter.

Catharus guttatus auduboni (Baird). Hermit Thrush. Presnall (1934) and Grater (1947) Bryce Canyon; Benson (1935) two specimens: Navajo Mountain (10,000 ft, species common); Woodbury and Russell (1945) specimen: Navajo Mountain, 14 July 1936 (*Picea-Abies* forest 10,000 ft); common (estimates 100 pairs) in *Picea-Abies* forest 6 and 11–18 July 1936 (nesting 16 July; absent 13 Aug.); BYU (1971) summit of Navajo Mountain, 13 Oct. Summer resident and transient in higher mountains and transient in lowland.

Sialia mexicana bairdi Ridgway. Western Bluebird. Presnall (1933 and 1934) and Russell and Thompson (1964) Bryce Canyon; Benson (1935) and Woodbury and Russell (1945) specimens at Navajo Mountain, 16 Aug. 1935 and 4 July 1936 (*Pinus ponderosa*); Behle et al. (1958) one, confluence of Calf Creek/Escalante River, 1954; BYU (1971) one (male), Cottonwood Wash, 7 Nov.; BYU (1972) Site 23, 25 seen 3 Mar. (mixed shrubs); and 11 miles east Grosvenor Arch, one seen (not identified to species), 17 June (woodland). Permanent resident.

Sialia currucoides (Bechstein). Mountain Bluebird. Presnall (1933 and 1934) and Grater (1947) Bryce Canyon (also late summer to late winter at Cedar Breaks); Tanner (1940a) Escalante drainage; Behle et al. (1958) Paria, 6 March 1946; Hayward et al. (1958) Escalante drainage; BYU (1971) one, Paria Plateau, 29 Sept.; BYU (1972) one, one mile south Glen Canyon City, 7 Feb.; Sites 3 and 6; Site 23, three seen on 24 Feb. (*Coleogyne*); Four Mile Bench, 25 seen 26 Oct. (woodland); BYU (1973) one (ad. male), eight miles east Glen Canyon City, 2 May; Warm Creek

Bay, two seen 10 June; and Four Mile Bench, 13 June (near a spring). Summer resident, a few may winter.

Myadestes townsendi townsendi (Audubon). Townsend's Solitaire. Presnall (1933 and 1934) and Grater (1947) Bryce Canyon; Behle et al. (1958) five miles west of Escalante, 20 Sept. 1935. Transient.

Sylviidae (Old World Warblers,
Gnatcatchers, and Kinglets)

Poliophtila caerulea amoenissima Grinnell. Blue-gray Gnatcatcher. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Benson (1935) Navajo Mountain; Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) five, Navajo Mountain Trading Post, 25 July 1936; Rock Creek/Colorado River, 26 July 1937; Kaiparowits Plateau, 30–31 July and 10 Aug. (*Artemisia*, woodland, *Quercus*, *Amelanchier*, 3300–7000 ft); Hayward et al. (1958) Escalante drainage; BYU (1971) Last Chance, 25 Sept. (*Tamarix*); BYU (1973) Sites 15 and 28 (*Juniperus*-grass); Lee's Ferry, 14–15 June (*Tamarix* and *Salix*); Cottonwood Wash/Paria River, 6 July; Ribbon Canyon; Paria/Colorado Rivers, 7 and 14 June (*Tamarix*); Tibbet Spring, two seen 5 June (*Populus*); and Wahweap Creek, 30 Apr. and 7 June. Summer resident (30 April to 25 Sept.).

Regulus satrapa Lichtenstein. Golden-crowned Kinglet. Russell and Thompson (1964) Bryce Canyon; BYU (1971) north of Church Wells; one, summit of Navajo Mountain, 13 Oct. Permanent resident.

Regulus calendula (Linnaeus). Ruby-crowned Kinglet. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Behle (1948) Lee's Ferry; Woodbury and Russell (1945) two, Navajo Mountain, 14 Aug. 1935 and 15 July 1936 (*Picea-Abies*, *Pinus ponderosa* forest, 9000–10,000 ft); breeds on top of Navajo Mountain. Permanent resident.

Bombycillidae (Waxwing)

Bombycilla cedrorum Vieillot. Cedar Waxwing. Behle et al. (1958) Bryce Canyon. Uncommon transient, some may breed (Behle et al. (1958).

Ptilogonatidae (Silky Flycatchers)

Phainopepla nitens lepida Van Tyne. Phainopepla. BYU (1973) near Tibbet Spring, 5 June; seen by Robert Whitmore in open brush. This species was previously known in southern Utah only from lower Santa Clara Valley, Washington County, to Kanab, Kane County (Hayward et al. (1976). Summer resident.

Laniidae (Shrikes)

Lanius excubitor Linnaeus. Northern Shrike. BYU (1973) Site 3, 3 Aug. Rare transient.

Lanius ludovicianus Linnaeus. Loggerhead Shrike. Benson (1935) Navajo Mountain area; Tanner (1940a) Escalante drainage; Woodbury and Russell (1945) one, Kaiparowits Plateau, 12 Aug. 1937; Rock Creek/Colorado River, 26 July 1937; Navajo Mountain Trading Post, 31 July 1936 (*Populus*, *Artemisia*, and *Amelanchier*, 4000–7000 ft); also in *Artemisia* flats, *Sarcobatus*, *Xanthocephalum*, *Atriplex confertifolia*, *Yucca*, and *Ephedra* types of cover (Woodbury and Russell 1945); Behle et al. (1958) 10 miles southeast of Escalante, 8 May 1954; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Sites 1 and 2; specimens at two miles southwest of Site 3, 28 Aug. and two miles west of Site 3, 20 Aug.; Sites 6 and 10; Cottonwood Wash, 7 Nov.; Four Mile Bench; Glen Canyon City; Pump Canyon Spring; Tibbet Spring; one, Warm Creek, two miles below road to Escalante, 6 Dec.; BYU (1973) one (ad. female), two mile southwest Glen Canyon City, 29 Apr. It is a permanent resident of the area according to Woodbury and Russell (1945). We saw 155 individuals between 1971 and 1973. Sightings (73) were distributed throughout the year, except for Feb. and Mar. when none were seen. Woodbury and Russell (1945) believed the species to be more plentiful in late summer after emergence of young. This agrees with our findings. We found the species very sparse in Nov. (2), Dec. (1), and Jan. (1); absent in Feb. and Mar.; and somewhat more frequent in Apr. (10), May (3), and June (3). It was common in July (28), reaching a peak in Aug. (56), and declining in numbers in Sept. (27)

and Oct. (16). It was most frequently encountered in woodlands, *Vancleavea*-grass, *Coleogyne*, *Ephedra*-grass, and *Atriplex*-grass in this order of abundance. Common permanent resident.

Sturnidae (Starlings)

Sturnus vulgaris vulgaris Linnaeus. Starling. Russell and Thompson (1964) Bryce Canyon; BYU (1971) two (males), Glen Canyon City, 2 Dec.; two seen 8 Dec.; BYU (1972) Glen Canyon City, two seen 5 Mar.; BYU (1973) Paria River/U.S. 89, 6 June. The starling is a newcomer to the area. Behle et al. (1958) reported sightings of this species in Jan. 1941 and Sept. 1948 for Kane County, but the observations by Russell and Thompson (1964) appear to be the first published observations of this species in the area of the current report. Earlier observers (Behle 1960, Woodbury and Russell 1945, Hayward 1976) did not report the species. The species is known in Utah to first occur as a migrant or winter visitant, followed later by permanent residency (Behle and Perry 1975). A similar pattern of occurrence in the Kaiparowits area suggests that the species is establishing itself here as a breeder also. Permanent resident.

Vireonidae (Vireos)

Vireo bellii Audubon. Bell's Vireo. BYU (1973) Lee's Ferry, 7 June. Until this vireo was seen at Lee's Ferry by Robert Whitmore it was known in Utah only from southwestern Utah (Hayward et al. (1976), where it is an uncommon summer resident (Behle and Perry 1975). Sparse summer resident.

Vireo vicinior Coues. Gray Vireo. Behle et al. (1958) specimen: confluence (Calf Creek/Escalante River, 1954; BYU (1973) Site 28, 13 June by Lloyd Pack in *Juniperus*-grass association. Behle et al. (1958) report this species as an uncommon resident of woodlands of the Kanab area and adjacent high plateaus. Although Behle and Perry (1975) consider it a common summer resident of southern Utah, in the area of the Kaiparowits Plateau it seems to be rather sparse, as suggested by only one sighting in 2½ years. Sparse summer resident.

Vireo solitarius (Wilson). Solitary Vireo. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Behle et al. (1958) consider *V. s. plumbeus* to be a fairly common summer resident in the lower reaches of Bryce Canyon. They observed this taxon in canyons vegetated with *Quercus gambellii*, *Acer negundo*, and *Populus fremontii*; Woodbury and Russell (1945) three (all *V. s. cassinii*), Navajo Mountain, 7 Aug. 1935, 11 Aug. 1936, and Lee's Ferry, 25 Aug. 1909, as recorded by the Nelson and Birdseye trip (*Populus tremuloides* and riparian forest, *Quercus* and *Salix*, 3100–9500 ft); it is probable that *V. s. plumbeus* breeds in the Kaiparowits Plateau and Navajo Mountain areas, although none have been seen. *Vireo s. cassinii*, on the other hand, is a migrant. Woodbury and Russell (1945) considered *V. s. plumbeus* as a summer resident of *Pinus ponderosa*, *Quercus*, and woodlands of the mesa tops and slopes of the Navajo country. Summer resident and transient.

Vireo gilvus (Vieillot). Warbling Vireo. Benson (1935) and Woodbury and Russell (1945) Navajo Mountain area, 17 Aug. 1935 and 4 Aug. 1936, and Kaiparowits Plateau, 2 Aug. 1937; Tanner (1940a) Kaiparowits Basin; Behle et al. (1958) Bryce Canyon. Although specimens from Garfield County, Utah, have been assigned to *V. g. swainsonii*, Worthen (1968) has questioned the presence of the race *swainsonii* in Utah (also see Hayward et al. 1976); it is probably a migrant (Behle and Perry 1975). The breeding population represents the race *leucopolius* (Behle and Perry 1975). Woodbury and Russell (1945) found this latter race in stands of *Quercus*, streamside *Populus fremontii* and *Salix*, and *Populus tremuloides*. On Navajo Mountain they encountered it in *Populus tremuloides* at 9000–10,500 ft. They also found breeding adults and two young, 16 to 18 July 1936. We did not encounter it. Summer resident.

Parulidae (Wood Warblers)

Vermivora celata (Say). Orange-crowned Warbler. Behle and Higgins (1959) Hole-in-the-Rock/Colorado River, 20 Oct. 1958 (riparian, 3266 ft); BYU (1971) Site 15, 9 Oct. Uncommon migrant.

Vermivora ruficapilla ridgwayi van Rossem. Nashville Warbler. Woodbury and Russell (1945) one, Navajo Mountain, 11 Aug. 1935 (*Pinus ponderosa*, 8500 ft). Transient.

Vermivora virginiae (Baird). Virginia's Warbler. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) Navajo Mountain, 17 July 1936 (*Populus tremuloides*) and Kaiparowits Plateau, 9 Aug. 1937 (pygmy forest, 7000–10,000 ft); Behle et al. (1958) confluence Calf Creek/Escalante River, 1954; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Site 4; ½ mile south Paria River Bridge, 3 Sept. According to Woodbury and Russell (1945), this warbler is a breeder of the deciduous brush and tree zones between 6000–10,000 ft. Summer resident.

Vermivora luciae (Cooper). Lucy's Warbler. Woodbury (1939) and Woodbury and Russell (1945) two, river mile 41, 8 Aug. 1938 (*Salix* and *Rhus*, 3180 ft); Colorado River side canyon, 13 July 1936 (*Salix* thickets, 3200 ft); seen at mouth of Paria River, 1938; ½ mile below Lee's Ferry, 30 July to 11 Aug. 1938; young out of nest, banks Colorado River, two miles below San Juan River, 17 July 1931; and single birds on the Colorado at river mile 41, 8 Aug. and one mile above Lee's Ferry, 10 Aug.; Woodbury and Russell (1945) believe this species to be a sparse inhabitant of *Salix* and brush thickets along the Colorado and San Juan Rivers; Behle (1948) Lee's Ferry; Behle et al. (1958) one, junction Calf Creek/Escalante River, 4 July 1938; BYU (1973) Lee's Ferry and one mile south of Paria, Utah, 7 June (*Salix* and *Tamarix*). Summer resident.

Dendroica petechia morcomi Coale. Yellow Warbler. Woodbury and Russell (1945) four, three miles below confluence San Juan/Colorado Rivers, 3 Aug. 1938; six at Rock Creek/Colorado River, 20–23 July 1937; one from Kaiparowits Plateau, 4 Aug. 1937; one from Navajo Mountain, 13 Aug. 1935; one from Lee's Ferry, 25 Aug. 1909; two along Colorado River, 11 July 1936; one and nest at river mile 63, 5 Aug. 1938; and two at river mile 50, 6 Aug.; (*Quercus*, *Salix*, riparian thickets, *Artemisia*, *Populus tremuloides*, 3120–7000 ft; nested below 6500–7000 ft in riparian *Salix*, brush or *Populus*); Behle and Higgins (1959) give the addi-

tional observational records from Woodbury's notes as follows: "many were seen at several points, six at two, and two at another, plus three family groups at one and six at another, from river mile 75 to the mouth of Paria Creek; common breeder 1 July to 9 Aug. 1958 in riparian vegetation along Glen Canyon"; Hayward et al. (1958) Escalante drainage; Russell and Thompson (1964) Bryce Canyon; BYU (1972) Reflection Canyon, 4 July and confluence San Juan/Colorado Rivers, 24 June (*Populus*-riparian); BYU (1973) Lee's Ferry, three seen 7 June (*Tamarix*) and one seen 15 June (*Tamarix*); one mile south of Paria near Paria River, 7 June (dense *Salix*); and Paria River/Colorado River, 7 June (*Tamarix*-*Salix*). Summer resident.

Dendroica coronata auduboni (Townsend). Yellow-rumped (Audubon's) Warbler. Presnall (1933) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) three, Navajo Mountain, 11 Aug. 1935; nests in *Pinus ponderosa*, 2 July 1936 (8500 ft; breeds 8000–10,000 ft, spring migration dates in general area of Navajo Mountain are 13 Apr.–25 May; and fall, 20 Aug.–14 Oct.); Behle (1948) Lee's Ferry; Behle et al. (1958) 10 miles west of Escalante, 7 May 1941; BYU (1971) one, summit Navajo Mountain, 13 Oct.; and 25 at Site 15, 9–10 Oct.; BYU (1973) Crosby Canyon Bay, two seen courting, 28 Apr. (*Tamarix*); and two seen 5½ miles south of Tibbet Springs, 1 May. The intermountain race *D. auduboni memorabilis* is now in synonymy with *D. a. auduboni* (Townsend) and the species has been placed in *Dendroica coronata*. Summer resident and fall and spring transient.

Dendroica nigrescens (Townsend). Black-throated Gray Warbler. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) six specimens: Kaiparowits Plateau, 31 July and 4, 5, and 9 Aug. 1937; Navajo Mountain, 14 Aug. 1935 and 2 Aug. 1936 (pygmy forest, 6000–9000 ft; a nearly obligate breeder in pygmy forest, migrating through most other vegetational types); BYU (1971) Site 12 and specimen (male): ½ mile north Nipple Spring, 16 Oct. Summer resident and transient spring and fall.

Dendroica townsendi (Townsend). Townsend's Warbler. Presnall (1933 and 1934)

Bryce Canyon; Woodbury (1939) two, Navajo Mountain, 10 Aug. 1936 (also seen 13 Aug. 1935); Kaiparowits Plateau, 12 Aug. 1927 (pygmy forest, *Pinus ponderosa*, 6000–7000 ft). Transient.

Dendroica occidentalis (Townsend). Hermit Warbler. Woodbury and Russell (1945) two, Navajo Mountain, 11 Aug. 1935 and 13 Aug. 1936 (*Pinus ponderosa*, 8500–10,000 ft). In 1935 this normally rare species was a common member of the band of warblers on Navajo Mountain during Aug. (Woodbury and Russell 1945). Transient.

Dendroica graciae graciae Baird. Grace's Warbler. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) seen at Navajo Mountain, 15–16 June 1938, and one collected but discarded, 15 June; Benson (1935) saw and heard them in *Pinus ponderosa*, but not numerous (Woodbury and Russell 1945). Summer resident.

Oporornis tolmiei (Townsend). MacGillivray's Warbler. Woodbury and Russell (1945) one, Navajo Mountain, *O. t. tolmiei*; Behle (1960) 5 Aug. 1936 (*Salix* in canyon bottoms); BYU (1971) Glen Canyon City; Kaibab Wash, 29 Sept. Summer resident.

Geothlypis trichas occidentalis Brewster. Common Yellowthroat. Woodbury and Russell (1945) two at Rock Creek/Colorado River, 20–26 July 1927 (large family flocks also seen in streamside thickets); one near Bridge Canyon, 12 July 1936; one from river mile 60, 6 Aug. 1938; and one from river mile 25, 9 Aug. 1938 (including nest); nest observed at river mile 63, 5 Aug. 1938 (*Salix*); family flocks mouth of Rock Creek, 20–26 July 1937; usually found in *Salix* reeds, canes, brush, or *Typhus* in canyons or valleys below 5500–6000 ft; Behle et al. (1958) confluence Calf Creek/Escalante River, 2 May 1954; Behle and Higgins (1959) 165 individuals seen, plus many others including 12 families (out of nest) at various points along the Colorado River by Woodbury and others during the Rainbow Bridge-Monument Valley expedition. Higgins (Behle and Higgins 1959) saw both adults and immatures in the *Salix* fringe at Lee's Ferry, 8 Aug. 1958, and found the species nesting abundantly during the summer of 1958 (Behle 1960). Woodbury and Russell (1945) noted that the habitats of the Yellow Warbler and Yellowthroat overlap,

but the warbler extended landward into *Populus fremontii*, whereas the yellowthroat extended toward the moist areas containing *Typhus* and *Juncus*. It is interesting that none were seen during this study. It is not known if this is because of the creation of Lake Powell or due to insufficient observations.

Icteria virens (Linnaeus). Yellow-breasted Chat. Woodbury and Russell (1945) three, Colorado River, 11 July 1936 and river miles 41 and 50, 7 and 8 Aug. 1938 (stream bank thickets, *Salix*, and *Rhus*); Behle et al. (1958) confluence of Calf Creek/Escalante. 1954, i.e., *I. v. auricollis* in dense vegetation. Behle and Higgins (1959) give the following additional records from the field notes of Woodbury and Russell for 1938 for the Colorado River from the Rainbow Bridge-Monument Valley expedition: 80 were counted from river mile 50 to ½ mile below Lee's Ferry near the mouth of Paria Creek, between 7 and 11 Aug. Higgins found them to be abundant breeders along the length of Glen Canyon. He saw them every day of the trip in the densest streamside vegetation. Russell and Thompson (1964) Bryce Canyon; BYU (1973) Lee's Ferry, a total of 12 were seen 6, 7, and 14–15 June; and along the Paria River near Paria, Utah, three were seen 7 and 14 June. We saw them in the *Tamarix* and *Salix* along the rivers. Summer resident.

Wilsonia pusilla pileolata (Pallas). Wilson's Warbler. Woodbury and Russell (1945) Navajo Mountain, one or two seen daily in *Populus tremuloides*, 9–16 Aug. 1935, and one, 1 Sept. 1934; Russell and Thompson (1964) Bryce Canyon; BYU (1973) lower Wahweap Creek, 30 Apr. Woodbury and Russell give the migration date through the area as 4–26 May in the spring and 9 Aug.–26 Oct. in the fall. Transient.

Ploceidae (Weaver Finches)

Passer domesticus (Linnaeus). House Sparrow. Woodbury and Russell (1945) Lee's Ferry/Paria River, several birds seen 10 Aug. 1938; Behle et al. (1958) Escalante; BYU (1971) Glen Canyon City, 30 seen 2 Dec. and 5 seen 8 Dec. Permanent resident.

Icteridae (Meadowlarks, Blackbirds,
and Orioles)

Sturnella neglecta neglecta Audubon. Western Meadowlark. Presnall (1934) Bryce Canyon; Behle et al. (1958) near Escalante in cultivated fields; Hayward et al. (1958) Escalante drainage; BYU (1971) Site 3 (no date, semiarid grasslands); and Paria Plateau, 29 Sept. Uncommon permanent resident.

Xanthocephalus xanthocephalus (Bonaparte). Yellow-headed Blackbird. Woodbury and Russell (1945) Lee's Ferry as recorded by Nelson and Birdseye's trip, 23–26 Aug. 1909; Russell and Thompson (1964) Bryce Canyon; Behle and Higgins (1959) river mile 25, three females seen, 6 Aug. 1958; BYU (1972) Warm Creek Bay, one pair seen on shore of Lake Powell, 3 May. Migration through the area is given by Woodbury and Russell (1945) as April–May passing north and 12 July–11 Oct. passing south. Transient.

Agelaius phoeniceus (Linnaeus). Red-winged Blackbird. Behle (1948) Aztec Creek, two seen; Russell and Thompson (1964) Bryce Canyon; Hayward et al. (1958) Escalante drainage; BYU (1973) one mile above Lee's Ferry (flying), 15 June. Transient.

Icterus parisorum Bonaparte. Scott's Oriole. Benson (1935) south of Navajo Mountain; BYU (1972) Site 4, 25 June (*Coloogyne*); BYU (1973) three miles northwest of Site 3, 29 Apr. (*Pinus edulis*); two miles north Site 3, 28 May (woodland); Site 6, 3 May (*Juniperus*); one mile east of Site 7, 4 July; and Site 28, 13 June (*Juniperus*-grass). All 1973 observations except the one July, were in *Juniperus*-grass or pygmy forest. No vegetation was given for the July sighting. Summer resident.

Icterus galbula bullockii (Swainson). Northern Oriole. Benson (1935) Beaver Creek/Navajo Mountain; Woodbury and Russell (1945) two, north foot and southwest foot of Navajo Mountain, 6 Aug. 1935 and 11 Aug. 1936 (*Populus fremontii* near woodland and *Quercus* community, 5500–6000 ft); Behle et al. (1958) confluence Calf Creek/Escalante River, 1954; Hayward et al. (1958) Escalante drainage; Behle and Higgins (1959) field notes of Rainbow Bridge-Monument Valley expedition of 1938; seven were seen along the Colorado River from river mile 75 to ½ mile below Lee's Ferry, 3–11 Aug.; Rus-

sell and Thompson (1964) Bryce Canyon; BYU (1961) one male and three females, Paria, 20 May; BYU (1973) Paria River/U.S. 89, two seen 6 June; and Cottonwood Canyon, 8 June; Hackberry Canyon, 8 June (male displaying); and Lee's Ferry, adult and fledgling seen in *Tamarix* and *Salix* 15 June. Excepting the 15 June sighting, all others were in stands of *Populus fremontii*. Summer resident.

Euphagus cyanocephalus (Wagler). Brewer's Blackbird. Presnall (1934) Bryce Canyon; Tanner (1940a) Escalante drainage; Behle et al. (1958) confluence of Calf Creek/Escalante River; Hayward et al. (1958) Escalante drainage; Behle and Higgins (1959) 5 were seen at mouth of Kane Creek, river mile 41, 1 Aug. 1958; BYU (1973) Lee's Ferry, three sightings totaled 53 birds, 7 June (*Tamarix*); Glen Canyon City, 50 seen 28 Apr. (grasslands); and Cottonwood Wash/Brigham Plains road, 2 seen 8 June (riparian vegetation). Transient, a few may nest and a few may winter.

Molothrus ater obscurus (Gmelin). Brown-headed Cowbird. Woodbury and Russell (1945) specimen: Colorado River at Rock Creek, 22 July 1937 (riparian thicket of *Tamarix* and *Salix*, 3100–3300 ft) and one egg found in the nest of Willow Flycatcher near Lee's Ferry, 11 Aug. 1938; Behle et al. (1958) Bryce Canyon; Behle and Higgins (1959) Colorado River/Rock Creek, 28 July 1958; BYU (1972) Site 3 on Cedar Mountain, 25 July (*Ephedra*-grass); BYU (1973) Cottonwood Wash, 5 June (*Populus*); and Lee's Ferry, one seen 7 June (*Tamarix*) and two seen 15 June (brush). Summer resident.

Thraupidae (Tanagers)

Piranga ludoviciana (Wilson). Western Tanager. Benson (1935) one, War God Spring on Navajo Mountain, 14 June 1933; Woodbury and Russell (1945) six, two at Navajo Mountain (War God Spring and Beaver Creek Canyon), 13 July, 7 Aug. 1936; one at Navajo Mountain Trading Post, 26 July [no year]; one at Colorado River/Rock Creek, 27 July 1937; one at Rock Creek, 28 July 1937; and one at Kaiparowits Plateau, 6 Aug. 1937; usually found in *Pinus ponderosa*, *Populus fremontii* and other riparian trees, chaparral,

and *Quercus*, 3300–8500 ft; Behle and Higgins (1959) Aztec Canyon at river mile 68.5, 7 July 1958; mouth of Kane Creek at river mile 41, 1 Aug.; and one mile upstream from mouth of Escalante River, several seen of both sexes, 19 July 1958. Woodbury and Russell (1945) saw this species during the breeding season in stands of *Pinus ponderosa* and *Picea-Abies* on Navajo Mountain; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Site 16 in *Tamarix*, 18 Aug.; BYU (1972) one mile south of Site 1, 8 June. Summer resident.

Fringillidae (Grosbeaks, Finches,
Sparrows, and Buntings)

Pheucticus melanocephalus melanocephalus (Swainson). Black-headed Grosbeak. Benson (1935) Navajo Mountain; Woodbury and Russell (1945) two, Navajo Mountain, 15 Aug. 1935 and 4 Aug. 1936 (*Salix* and *Picea-Abies* forest, 6500–10,300 ft); they give post-breeding dates 23 July to 15 Aug. 1934–38 at Navajo Mountain Trading Post, Beaver Creek Canyon, and Lee's Ferry. They indicated that it breeds at canyon heads and mountains mostly below the coniferous forest, among *Quercus*, but mostly above the pygmy forest; it may descend into the streamside fringes of lower elevations. Woodbury and Russell (1945) record extreme occurrence dates as 8 May and 22 September; Hayward et al. (1958) Calf Creek area; Behle and Higgins (1959) mouth of Aztec Creek at river mile 68.5 in stands of *Quercus*, 26 July 1958; river mile 46 in *Salix*, 30 July 1958; and from Woodbury and Russell's field notes (Behle and Higgins 1959) between river miles 63 and 50, 5 Aug. 1938; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Site 4 and ½ mile south of Paria Bridge, 30 Sept. Summer resident.

Guiraca caerulea interfusa (Dwight & Griscom). Blue Grosbeak. Presnall (1934) Bryce Canyon; Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) 2 at river mile 13, 9–10 Aug. 1938; 3 near Lee's Ferry, 17 July 1936 and 9–11 Aug. 1938 (*Tamarix* and *Salix* 3100 ft); in addition 14 birds seen including a nest and two nestlings, 10–11 Aug. 1938; Higgins (Behle and Higgins 1959) found it an abundant breeder in dense streamside vegetation along the length of

Glen Canyon; BYU (1971) Site 16, 8 Aug. (*Tamarix*); BYU (1972) 3 seen in Cottonwood Wash, 22 July (*Tamarix*); BYU (1973) Lee's Ferry, a total of 5 birds seen in *Tamarix*, 6–15 June. Common summer resident in riparian vegetation.

Passerina cyanea (Linnaeus). Indigo Bunting. BYU (1973) Cottonwood Wash, 6 June. One was seen by Robert Whitmore in *Tamarix-Populus fremontii* association about six miles up Cottonwood Wash from U.S. Highway 89. Lazuli Buntings were also present. Whitmore (1975) noted apparent competition between males of the two species in the Paria River area. Other sightings include Lee's Ferry where Whitmore (1975) observed the species in *Tamarix*. As noted by Whitmore, the species apparently has moved into the Paria River drainage since the investigations of Woodbury and Russell (1945) and Behle et al. (1958). Whitmore (1975) also summarized the expansion of the species into Utah. Summer resident.

Passerina amoena (Say). Lazuli Bunting. Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) two, Navajo Mountain, 13 Aug. 1935, and Colorado River/Rock Creek, 20 July 1937 (riparian thicket, under shrubs, *Populus tremuloides*, and *Pinus ponderosa*, 3300–9000 ft); Russell found it fairly common on lower Navajo Mountain, 10–16 Aug. 1936; Behle and Higgins (1959) Kane Creek and river mile 41, 1 Aug. 1958; BYU (1973) in Cottonwood Wash at six (five seen 5–6 June), eight (two seen 6 June), and nine (six seen 6 June) miles north of U.S. Highway 89, Kane County, Utah. Two sightings were in *Atriplex canescens*, one was in *Juniperus-Tamarix*, and the remainder were in *Tamarix*. Whitmore (1975) noted the Lazuli Bunting nesting in the Paria River area. Extreme dates of occurrence are 15 May and 28 Aug. (Woodbury and Russell 1945). Summer resident.

Hesperiphona vespertina (Cooper). Evening Grosbeak. Presnall (1934) Bryce Point; BYU (1972) Cottonwood Wash, four seen in stands of *Pinus-Juniperus*, 26 Oct. Fall and winter visitant.

Carpodacus cassinii Baird. Cassin's Finch. Woodbury and Russell (1945) two specimens: Navajo Mountain 9 and 14 Aug. 1935 (9000 ft); it is a sparse breeder in stands of *Pinus*

ponderosa; Russell and Thompson (1964) Bryce Canyon. Summer resident.

Carpodacus mexicanus frontalis (Say). House Finch. Woodbury and Russell (1945) two, Navajo Mountain Trading Post, 26 July 1936 and mouth of Rock Creek, 23 and 26 July 1937 (*Populus fremontii* and riparian vegetation, 3300–6500 ft); Behle (1948) Aztec Creek and Lee's Ferry; Behle et al. (1958) confluence Calf Creek/Escalante River, 1954, and Paria River, 6 Mar. 1946; Hayward et al. (1958) Escalante drainage; Russell and Thompson (1964) Bryce Canyon; Behle and Higgins (1959) Higgins found them abundant in Glen Canyon during summer 1958; they were seen nearly every day in streamside vegetation, on the terraces, and on the hill-sides; Behle and Higgins (1959) give the following additional unpublished data from Woodbury and Russell's field notes: "species common and conspicuous between river miles 78 and zero of the Colorado River, 4–22 July 1936; along the Colorado River, 22 were counted and many others seen between river mile 75 and Paria Creek, 3–11 Aug. 1938"; BYU (1971) one, Warm Creek, 8 Nov.; Wiregrass Spring; Lee's Ferry; three (ad. males), Tibbet Spring, 16 Oct.; Wahweap Creek; Escalante River Bay; Driftwood Canyon; T43S R2W Sec 19, 7 Dec.; Three Garden; 2 miles south Church Wells, 10 Nov.; T43S R2W Sec 24, 7 Dec.; along the Escalante River; Paria Plateau, 29 Sept., and mouth of Long Canyon 18 Dec.; BYU (1972) Driftwood Canyon; Three Garden; mouth of Escalante Canyon, 24–25 June; and Wiregrass Spring, 22 July; BYU (1973) Highway 273/Wahweap Creek, 20 Apr.; five miles north of Site 34, 1 May; left fork Tibbet Spring, 5 June; Sites 6, 23, 28, and 30, 6–13 June; Sites 2 and 3, 12 July–9 Aug.; Cottonwood Wash, 9 miles north Highway 89; Lee's Ferry, Paria/Colorado Rivers, Paria River, Tibbet Spring, and Wahweap Creek, 30 Apr.–15 June; Glen Canyon City, 17 Aug. The greatest numbers were seen in the winter. Three large flocks were seen 8 Nov. 1971, and two flocks each containing about 300 birds and another containing 50 were seen 7–18 Dec. 1971. From 1971–1973, 2 finches were seen in Apr., 46 in June, 8 in July, and 12 in Aug. In April–June 1973, when House Finches are expected to nest, 8

were seen in *Tamarix*, 2 in *Pinus edulis*, and one each in *Coleogyne*, *Juniperus*-grass, and *Salix*; 2 were seen during July in semiarid grasslands and *Tamarix*. The 4 seen in June 1972 were in hanging gardens. The November and December 1971 flocks were in semiarid grasslands and *Juniperus*. The August 1973 sightings were in semiarid grassland (10), *Artemisia* (5), woodland (2), *Vanceleva*-grass (1), and Glen Canyon City (1). Permanent resident; abundant in winter.

Pinicola enucleator (Linnaeus). Pine Grosbeak. Presnall (1934) Bryce Canyon Rim. Summer resident.

Leucosticte tephrocotis tephrocotis (Swainson). Gray-crowned Rosy Finch. Behle et al. (1958) Paria River (see Black Rosy Finch). Winter resident or transient.

Leucosticte atrata Ridgway. Black Rosy Finch. Behle et al. (1958) Paria River, about 300 mixed with Gray-crowned Rosy Finch, 6 Mar. 1946; BYU (1971) Warm Creek; seven miles above Escalante; Warm Creek drainage near Tibbet Spring, 200–400 seen 6 Dec.; 3 females, 2 males, Tibbet Canyon, 7 Dec.; Nipple Bench above Tibbet Canyon, 1000 seen 9 Dec.; and ½ mile up long Canyon, 200 seen 16 Dec.; BYU (1972) three miles south of Tibbet Spring in Tibbet Canyon, 200 seen 14 Feb. and Grosvenor Arch pond, 100 seen 26 Oct.; BYU (1973) Tibbet Canyon, 25 seen 25 Jan. and Tibbet Spring, 100 seen 1 Mar. The earliest fall sighting was 26 October; the latest spring sighting was 6 March. They were encountered in *Chrysothamnus* (1000), washes (300), woodlands (200), *Artemisia* (100), and salt wash (25). Locally abundant, winter resident.

Carduelis pinus pinus (Wilson). Pine Siskin. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain; Woodbury and Russell (1945) Russell saw from one to four birds almost daily on Navajo Mountain, 13–21 July (*Picea-Abies* forest); BYU (1971) Grand Bench, 5 Oct. Summer resident and transient.

Carduelis tristis pallida (Mearns). American Goldfinch. Behle et al. (1958) confluence of Calf Creek/Escalante River 1954; Long (1937) Bryce Canyon, 23 Nov. 1935; Russell and Thompson (1964) Bryce Canyon; BYU (1971) Grand Bench, 5 Oct. and three (males) Nipple Spring, 6 Dec.; BYU (1972) Cedar Mountain. Permanent resident.

Carduelis psaltria hesperophila (Oberholser). Lesser Goldfinch. Presnall (1934) and Behle et al. (1958) Bryce Canyon; Woodbury and Russell (1945) Navajo Mountain, two adults and three young seen on 10, 11, and 13 July 1936 and Navajo Mountain Trading post, two or three in *Populus fremontii*, 27–29 July 1936; believed to nest in larger stands of *Populus* and *Salix* (Monson Expedition in Navajo Country as recorded in Woodbury and Russell 1945). Permanent resident.

Loxia curvirostra Linnaeus. Red Crossbill. Presnall (1934) and Russell and Thompson (1964) Bryce Canyon; Woodbury (1939) 2, Navajo Mountain obtained from a flock of 12, i.e., one *L. c. bendierei*, 13 Aug. 1935, the other *L. c. stricklandi*, 12 Aug. 1935; Woodbury and Russell (1945) flock of 30–40 crossbills were seen many times by Russell in stands of *Pinus ponderosa* and *Picea-Abies* on Navajo Mountain, 2–23 July 1936. Transient.

Pipilo chlorurus (Audubon). Green-tailed Towhee. Presnall (1934) Bryce Canyon; Woodbury and Russell (1945) two, Kaiparowits Plateau at 7000 ft in bushes of *Amelanchier*, 3 and 12 Aug. 1937; seen several times in *Amelanchier* and *Quercus* in the heads of canyons on Kaiparowits Plateau, late July and early Aug. 1913 [1937], believed to be nesting. Extreme dates for the general area by Woodbury and Russell (1945) were 22 Aug.–13 Oct. in the fall and 29 April–11 May in the spring. Summer resident.

Pipilo erythrophthalmus montanus Swarth. Rufous-sided Towhee. Benson (1935) three, Navajo Mountain in thickets beneath *Pinus ponderosa*; Woodbury and Russell (1945) three, Navajo Mountain, 3 July and 7 Aug. 1936, and 11 Aug. 1935, and five from Kaiparowits Plateau, 30 July–10 Aug. 1937 (*Archtostaphylos* under *Pinus ponderosa*, *Salix*, *Populus tremuloides*, chaparral, i.e., very common in bushy thickets, 6000–8500 ft); Behle et al. (1958) Escalante drainage; Behle and Higgins (1959) one of two seen was collected at mouth of Aztec Creek, 26 July 1958; eight seen Navajo Creek Canyon, 9 July 1936 (Rainbow Bridge-Monument Valley expedition); Russell and Thompson (1964) Bryce Canyon; BYU (1972) Three Garden located one mile above the confluence of San Juan River and Lake Powell, 4 July (hanging

gardens). Summer resident, a few may winter.

Passerculus sandwichensis nevadensis Grinnell. Savannah Sparrow. Presnall (1934) Bryce Canyon; Tanner (1940a) Kaiparowits Basin; Behle et al. (1958) 10 miles south of Escalante, 1954; Hayward et al. (1958) Escalante drainage. Transient.

Ammospiza leconteii (Audubon). LeConte's Sparrow. [Hypothetical] BYU (1973) Site 2, one seen by Clyde L. Pritchett, 1 Aug. This species is considered by Behle and Perry (1975) and Hayward et al. (1976) to be of accidental, rare occurrence in Utah. They note a specimen from Provo, Utah, 24 Dec. 1927, and three observations there on 10 Mar. 1928; one was also seen at Moab, 19 Apr. 1966. This adds one additional sight record for the state. Transient.

Pooecetes gramineus confinis Baird. Vesper Sparrow. Presnall (1934) Bryce Canyon; Tanner (1940a) Kaiparowits Basin; Behle et al. (1958) 10 miles south of Escalante, 1954; BYU (1972) one mile above confluence of the San Juan/Colorado Rivers, 25 June (hanging garden pool); BYU (1973) one (ad. female), two miles southwest Glen Canyon City, 30 Apr.; Site 1, two seen 30 Apr.; Site 8, 3 May; and one mile north of Site 10, several flocks seen, 1 May; 1973 sightings were in *Van-devea*-grass, *Grayia-Coleogyne*, and *Ephedra*-grass. Summer resident, more common in migration.

Chondestes grammacus strigatus Swainson. Lark Sparrow. Presnall (1934) Bryce Canyon; Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) two, Kaiparowits Plateau, 4 Aug. 1937; Navajo Mountain Trading Post (*Artemisia tridentata*, 6000–7000 ft); Behle and Higgins (1959) Colorado River/San Juan River and river mile 75, 2–3 Aug. 1938 (Woodbury's field notes of Rainbow Bridge-Monument Valley Expedition, 1938); Hayward et al. (1958) Escalante drainage; Behle et al. (1958) Bryce Canyon, confluence of Calf Creek/Escalante River, and Hayward et al. (1958) Escalante drainage; Behle et al. (1958) Bryce Canyon, confluence Calf Creek/Escalante River, and 10 miles south of Escalante, 7 May 1954. Extreme dates of arrival and departure for the general area are 28 Apr. and 14 Sept., respectively (Woodbury and Russell 1945).

Nesting takes place on open flats in medium dense brush and often in savannah at the woodland edges or openings (Woodbury and Russell 1945). Summer resident.

Aimophila cassinii (Woodhouse). Cassin's Sparrow. [Hypothetical] BYU (1973) Sites 1, 2, and 3, small flocks common, 30 Apr.; Wahweap Creek, 30 Apr.; and Tibbet Canyon, small flocks common, 1 May. The Cassin's Sparrow was placed on the hypothetical list of the birds of Utah by Behle and Perry (1975). The present observations made by Lloyd Pack are questionable. He possibly observed Brewer's and Chipping Sparrows instead of Cassin's Sparrows. Transient.

Amphispiza bilineata deserticola Ridgway. Black-throated Sparrow. Woodbury and Russell (1945) 3, Rock Creek/Colorado River, 21 July 1937; Navajo Mountain Trading Post, 27 July 1936 and 6 Aug. 1935 (desert brush at 3200–6500 ft and *Artemisia tridentata* at 5800–6500 ft); Woodbury and Russell (1945) give extreme dates of occurrence in the Navajo County as 12 Apr. and 1 Sept. with exception of 20 birds seen 29–30 November; Behle and Higgins (1959) report that during the Rainbow Bridge-Monument Valley expedition Woodbury observed this species at river mile 63, 5 Aug. 1938, river mile 50, a few seen 6 Aug. 1938, four miles up Last Chance Creek, a few seen 7 Aug. 1938, river mile 41, 2 seen 8 Aug. 1938, and mouth of Paria Creek, 3 seen 11 Aug. 1938; Behle et al. (1958) 10 miles south of Escalante/Kaiparowits Plateau, Aug. 1957; Behle and Higgins (1959) mouth of Aztec Creek and Woodbury saw more than 6 along the Colorado River from mile 63 to the Paria Creek, 5–11 Aug.; BYU (1971–1973) Sites 1, 2, and 30; Glen Canyon City, Cottonwood Wash/Paria River; Tibbet Spring; and one mile above confluence of San Juan/Colorado Rivers. Our earliest spring observation of this species is 1 May (1973). The latest in the fall is 8 Aug. (1973). Numbers seen were greatest in Aug. (35) and least in May (6); in addition, 20 were seen in June and 12 in July. Fifteen of the birds were seen in scattered brush consisting of *Artemisia tridentata*-*Ephedra* and other desert species, 4 in *Juniperus* or *Juniperus-Artemisia*, and 2 in *Tamarix*. Woodbury and Russell (1945) believe this species is

closely associated in its distribution with *Coleogyne*, from the lower part of the pygmy forest downward. Common summer resident.

Amphispiza belli nevadensis (Ridgway). Sage Sparrow. Benson (1935) south of Navajo Mountain; Woodbury and Russell (1945) 2, Warm Creek, 15 July 1936, and five miles south Navajo Mountain Trading Post, 30 July 1936 (*Salix*, *Artemisia*, 3100–6500 ft); Woodbury and Russell (1945), commonest bird of open *Artemisia* flats south of Navajo Mountain, with at least 100 seen in a single day; Russell and Thompson (1964) Bryce Canyon; BYU (1971) one mile south Glen Canyon City, 10 Nov.; Grand Bench, 10 Oct.; Warm Creek Inlet, 8 Nov. and 6 Dec.; Tibbet Canyon, near spring, 4 Dec.; and two miles east of Nipple Butte, 6 Dec.; BYU (1972) Site 1, 25 Jan. and 7 Feb.; Tibbet Spring, 25 Jan.; BYU (1971–1973) Sites 2, 3, 6, 10, 12, 13, 14, 15, 23, and 28 and Cottonwood Wash. Sage Sparrows winter in the area; the largest numbers were seen in Dec. (67) and Jan. (34). None were seen in Mar., 17 in Apr., 12 in June, one in July, 18 in Aug., none in Sept., and 3 in Nov. Although this species is expected to occur in *Artemisia* during the nesting season (May–June), it was encountered in *Grayia* (2), *Coleogyne-Vancleavea* (19), *Artemisia tridentata* (1), *Artemisia-Juniperus* (1), and *Atriplex* (3). During the remaining period they were recorded in *Mahonia* (40), *Artemisia tridentata* (25), *Cercocarpus* (10), *Chrysothamnus* (6), *Juniperus* (2), *Juniperus-Artemisia* (1), *Ephedra* (1), grass (1), *Atriplex* (1), and unidentified shrubs (13). The Dec. and Jan. birds were recorded in *Cercocarpus* (10), *Ephedra-Atriplex-Chrysothamnus* (4), *Mahonia* (40), *Artemisia tridentata* (25), and mixed shrub-grass (5). Common permanent resident.

Junco hyemalis (Linnaeus). Dark-eyed Junco. In the thirty-second supplement to the American Ornithologists Union Check-list of North American Birds (Auk 90:411–419, April 1973), the committee on classification and nomenclature considered most of the *Junco* species conspecific with *J. hyemalis*. Following this pattern we are combining all the juncos in the Kaiparowits Basin, except one, into the *hyemalis* complex. The former specific names now become the subspecific names. *Junco caniceps* is currently under

study and therefore is presently maintained as a separate species.

Junco hyemalis oreganus (Townsend) (= *J. oreganus montanus* and *J. o. shufeldti*). Presnall (1934) *J. o. oreganus* (= *J. shufeldti*) at Bryce Canyon; Grater (1947) Bryce Canyon; Behle et al. (1958) confluence Calf Creek/Escalante River, 1954; and BYU (1971) Site 12; Site 15, 10 Oct.; Cottonwood Wash, 13 Nov.; Tibbet Spring, 4 Dec.; and Wahweap Creek, 16 Dec.; BYU (1972) Wahweap Creek, 28 Jan.; Tibbet Spring, 25 Jan.; and Cockscomb, 28 Jan. The earliest fall observations of juncos are 10 Oct. 1971 and 26 Oct. 1972; the latest spring sighting is 28 Jan. 1972. The greatest numbers were seen Dec. (48 + a large flock). Juncos were observed in *Tamarix* (35), *Cercocarpus* (10), mixed shrubs (10), *Mahonia* (3), *Chrysothamnus* (3), *Populus fremontii*-*Tamarix* (1). Common transient and winter visitant.

Junco caniceps caniceps (Woodhouse). Gray-headed Junco. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain, breeding bird, common 1–23 July 1933; Woodbury and Russell (1945) seven, Navajo Mountain, 14 Aug., 1935 and 2–18 July 1936 (*Populus tremuloides*, *Pinus*, *Picea-Abies*, 8500–10,000 ft); Behle et al. (1958) confluence Calf Creek/Escalante River, 1954; BYU (1971) Navajo Mountain summit, 12 Oct.; Cottonwood Wash, 7 Nov., and a large flock was seen, 7 Nov. (*Populus fremontii*) and one was seen in Dec. (*Juniperus*). Found on Navajo Mountain as a breeding bird between 1 to 23 July 1936 (Woodbury and Russell 1945). Common summer resident of Navajo Mountain, winters in lowlands.

Spizella arborea (Wilson). Tree Sparrow. BYU (1971) one (male), Warm Creek Inlet, 8 Nov. Rare transient or winter visitant.

Spizella passerina arizonae Coues. Chipping Sparrow. Presnall (1934) Bryce Canyon; Benson (1935) Navajo Mountain area; Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) river mile 69, 3 Aug. 1938; 3 specimens: Navajo Mountain Trading Post, 23 July 1936; Navajo Mountain, 16 Aug. 1935, and Navajo Mountain Trading Post, 23 July 1936 (*Pinus ponderosa*, pygmy forest, 6500–9000 ft); also observed 69 miles above Lee's Ferry, 3 Aug. 1938; Behle et al. (1958) confluence Calf Creek/Escalante River, 13

June (stand of *Juniperus*-grass); Russell and Thompson (1964) Bryce Canyon; BYU (1973) Site 28 (*Artemisia tridentata*); Woodbury and Russell (1945) reported seeing 1074 individuals of this species (15 sightings) between 12 Apr. and 13 Oct. 1936–38. Our paucity of records may be due to the difficulty of inexperienced observers in distinguishing among the various species of small sparrows. It is probable that many were misidentified, e.g., Cassin's Sparrow as previously mentioned as well as Brewer's Sparrow. Summer resident, spring, and fall transient.

Spizella breweri breweri Cassin. Brewer's Sparrow. Tanner (1940a) Kaiparowits Basin; Woodbury and Russell (1945) three, Kaiparowits Plateau, 31 July 1937; Navajo Mountain, 8 Aug. 1936; and Navajo Mountain Trading Post, 30 July 1936 (*Artemisia tridentata*, pygmy forest, 6500–7000 ft); observed at Lee's Ferry, 14–26 Aug. 1909, by E. W. Nelson; Behle et al. (1958) confluence Calf Creek/Escalante River, 1954, and 10 miles south of Escalante, 8 May 1954; BYU (1971) one, Site 2, 28 Aug.; one, Church wells, 28 Sept.; and one Paria Plateau, 29 Sept.; BYU (1973) Site 4, 6 June; Site 6, 10 seen 4 July; Site 23, 5 June; Site 28, 13 June; Cottonwood Wash road, 1½ miles north of U.S. Highway 89, 6 June and 13 miles north of U.S. Highway 89, 8 June; Hackberry Canyon/Cottonwood Wash, two seen 8 June; and Kelly Grade/Smoky Mountain, 3 July. Although the species is primarily a bird of *Artemisia tridentata*, most sightings were in open or scattered desert shrub and one was in a *Juniperus*-grass association. Common summer resident and migrant.

Zonotrichia querula (Nuttall). Harris Sparrow. BYU (1973) one specimen (ad. male), three miles east of Glen Canyon City, 30 Apr. Winter visitor of lower and warmer valleys.

Zonotrichia leucophrys (Forster). White-crowned Sparrow. Tanner (1940a) Kaiparowits Basin; Behle (1948) Lee's Ferry; Behle et al. (1958) specimens at confluence Calf Creek/Escalante River (*Z. l. gambelii* and *oriantha*) and 10 miles south of Escalante, 7–8 May 1954; Russell and Thompson (1964) Bryce Canyon; Presnall (1934) recorded *Z. l. gambelii* from Bryce Canyon; it is a common migrant in Bryce Canyon fall and spring.

occurring in mixed flocks of *Z. l. oriantha*; BYU (1961) two (females), old Paria townsite, 20 May; BYU (1971) Site 15, 9 Oct. (salt wash vegetation); Cottonwood Wash, 7 Nov.; BYU (1972) Tibbet Spring, 30 seen 15 Apr.; BYU (1973) Wahweap Creek, 30 Apr. Transient and winter visitant.

Passerella iliaca (Merrem). Fox Sparrow. BYU (1971) one (not kept), Wahweap Creek, 4 Nov. Transient.

Melospiza lincolni alticola (Miller & McCabe). Lincoln's Sparrow. Behle et al. (1958) Bryce Canyon. Transient.

Melospiza melodia montana Henshaw. Song Sparrow. Russell and Thompson (1964) Bryce Canyon; Behle and Higgins (1959) Kane Creek at river mile 41, 2 seen 18 Oct. 1958; BYU (1971) Site 12 (*Coleogyne*); Glen Canyon City; and one (not kept), Nipple Spring, 15 Oct. Transient.

Summary of Birds of Kaiparowits Region (183)

Permanent Residents (36)

Buteo jamaicensis calurus
Aquila chrysaetos canadensis
Dendragapus obscurus
Centrocercus urophasianus urophasianus
Otus asio
Otus flammeolus
Bubo virginianus pallescens
Glaucidium gnoma californicum
Asio otus
Perisoreus canadensis capitalis
Cyanocitta stelleri macrolopha
Aphelocoma coerulescens woodhousei
Corvus corax sinuatus
Gymnorhinus cyanocephalus
Nucifraga columbiana
Parus atricapillus garrinus
Parus gambeli
Parus inornatus ridgwayi
Psaltiriparus minimus
Sitta carolinensis nelsoni
Sitta canadensis
Sitta pygmaea melanotis
Certhia familiaris
Cinclus mexicanus unicolor
Troglodytes aedon parkmanii
Catherpes mexicanus conspersus
Sialia mexicana bairdi
Regulus satrapa
Regulus calendula
Lanius ludovicianus
Sturnus vulgaris vulgaris
Passer domesticus
Carpodacus mexicanus frontalis
Carduelis tristis pallida

Carduelis psaltria hesperophila
Amphispiza belli nevadensis

Uncommon or Sparse Permanent Residents (7)

Haliaeetus leucocephalus
Lophortyx gambelii gambelii
Phasianus colchicus
Alectoris chukar
Strix occidentalis lucida
Colaptes auratus cafer
Sturnella neglecta neglecta

Spring-Summer Residents—May Be Uncommon (3)

Egretta thula
Nycticorax nycticorax
Anas strepera

Summer Residents—Common or Abundant (57)

Ardea herodias
Accipiter striatus velox
Buteo swainsoni
Falco mexicanus
Actitis macularia
Columba fasciata fasciata
Zenaidura macroura
Chordeiles minor henryi
Aeronautes saxatalis saxatalis
Archilochus alexandri
Selasphorus platycercus platycercus
Selasphorus rufus
Sphyrapicus thyroideus
Picoides villosus leucothorax
Picoides pubescens leucurus
Tyrannus verticalis
Tyrannus vociferans vociferans
Myiarchus cinerascens cinerascens
Sayornis nigricans
Sayornis saya saya
Empidonax traillii
Empidonax oberholseri
Empidonax uirgatus
Empidonax difficilis hellmayri
Nuttallornis borealis
Eremophila alpestris leucolacca
Tachycineta thalassina lepida
Riparia riparia riparia
Stelgidopteryx ruficollis
Petrochelidon pyrrhonota pyrrhonota
Thryomanes bewickii eremophilus
Mimus polyglottos leucopterus
Dumetella carolinensis
Toxostoma bendirei
Catharus guttatus auduboni
Poliophtila caerulea amoenissima
Phainopepla nitens lepida
Vireo gilvus
Vermivora virginiae
Vermivora luciae
Dendroica petechia morcomi
Dendroica graciae graciae
Geothlypis trichas occidentalis
Icteria virens
Icterus parisorum
Icterus galbula bullockii

Molothrus ater obscurus
Piranga ludoviciana
Pheucticus melanocephalus melanocephalus
Guiraca caerulea interfusa
Passerina cyanea
Passerina amoena
Carpodacus cassinii
Pinicola enucleator
Pipilo chlorurus
Chondestes grammacus strigatus
Amphispiza bilineata deserticola

Summer Residents, Some May Winter (6)

Branta canadensis
Falco sparverius sparverius
Salpinctes obsoletus obsoletus
Turdus migratorius propinquus
Sialia currucoides
Pipilo erythrophthalmus montanus

Summer Residents, Transient or Migrant during Spring and/or Fall (10)

Accipiter cooperii
Sphyrapicus varius
Vireo solitarius
Dendroica coronata auduboni
Dendroica nigrescens
Oporornis tolmiei
Carduelis pinus pinus
Poocetes gramineus confinus
Spizella passerina arizonae
Spizella breweri breweri

Uncommon Summer Residents, May Be Spring-Fall Transients (12)

Carthartes aura teter
Accipiter gentilis atricapillus
Falco peregrinus anatum
Falco columbarius bendirei
Fulica americana
Charadrius vociferus vociferus
Athene cunicularia hypugaea
Phalaenoptilus nuttallii nuttallii
Melanerpes lewis
Contopus sordidulus relici
Vireo bellii
Vireo vicinior

Late Fall/Fall-Winter Residents (3)

Podiceps nigricollis
Podilymbus podiceps
Pica pica hudsonia

Winter Residents (4)

Buteo lagopus
Leucosticte atrata
Junco hyemalis oreganus
Zonotrichia querula

Transients, Some May Nest, Some May Winter (20)

Anas crecca
Bucephala clangula
Myadestes townsendi townsendi
Vermivora ruficapilla ridgwayi
Dendroica townsendi
Dendroica occidentalis

Wilsonia pusilla pilcolata
Xanthocephalus xanthocephalus
Agelaius phoeniceus
Euphagus cyanocephalus
Leucosticte tephrocotis tephrocotis
Loxia curvirostra
Passerculus sandwichensis nevadensis
Ammonsiza lecontei
Aimophila cassinii
Junco caniceps caniceps
Zonotrichia leucophrys
Passerella iliaca
Melospiza lincolni alticola
Melospiza melodia montana

Uncommon Spring-Summer Transients (3)

Anas discors
Bucephala albeola
Larus delawarensis

Spring-Fall Transients (2)

Anas acuta
Anas cyanoptera

Fall Transients (3)

Steganopus tricolor
Larus californicus
Hesperiphona vespertina vespertina

Uncommon Transients (5)

Plegadis chihi
Anas platyrhynchos
Anas americana
Aythya valisineria
Buteo regalis
Oreoscoptes montanus
Bombycilla cedrorum
Vermivora celata

Sparse Transients (5)

Catoptrophorus semipalmatus inornatus
Calidris mauri
Stellula calliope
Myiarchus tyrannulus
Iridoprocne bicolor

Rare Transients or Winter Visitants (4)

Aechmophorus occidentalis
Pelecanus erythrorhynchos
Lanius excubitor
Spizella arborea

Formerly More Abundant Than Indicated by This Study (4)

Cathartes aura teter
Actitis macularia
Phalaenoptilus nuttallii nuttallii
Geothlypis trichas occidentalis

Range Extensions into Kaiparowits Basin (5)

Myiarchus tyrannulus
Phainopepla nitens lepida
Sturnus vulgaris vulgaris
Passerina cyanea
Ammonsiza lecontei

MAMMALS

In general we have followed Durrant's (1952) classification with regard to the nomenclature and taxonomy of mammals.

Soricidae (Shrews)

Sorex obscurus obscurus Merriam. Dusky Shrew. This species has been collected on Boulder Mountain just north of Escalante (Durrant 1952); it probably occurs on the portion of Boulder Mountain in the Kaiparowits Basin. This is within the range of the species as indicated by Durrant.

Sorex palustris navigator (Baird). Water Shrew. Reported by Tanner (1940a) from the Kaiparowits Basin.

Sorex merriami leucogenys Osgood. Merriam Shrew. Benson (1935) reported this species as *S. leucogenys*, but in 1939 combined it with *S. merriami* as a subspecies. This was based on five specimens from War God Spring on Navajo Mountain.

Vespertilionidae (Vespertilionid Bats)

Myotis yumanensis yumanensis H. Allen. Yuma Bat. Durrant and Dean (1959) collected 10 specimens from along Glen Canyon and 8 from a large colony at the mouth of the Escalante River.

Myotis volans interior Miller. Hairy-winged *Myotis*. Reported by Benson (1935) from Rainbow Bridge.

Myotis leibii melanorhinus (Merriam). Small-footed Bat. Durrant and Dean (1959) made a collection at the mouth of Kane Creek on the Colorado River.

Lasionycteris noctivagans (LeConte). Silver-haired Bat. Tanner (1940a) reported this species from the Kaiparowits Plateau.

Pipistrellus hesperus hesperus H. Allen. Western Pipistrelle. Benson (1935) reported a collection from Rainbow Bridge and Tanner (1940a) reported it from the Kaiparowits Plateau. Durrant and Dean (1959) indicate that this is the most common bat in Glen Canyon. They collected two individuals at Lee's Ferry and one from river mile 91. Cockrum (1960) also collected this species at Lee's Ferry. Pritchett (1962) reports this species occurring on both sides of the Cocks-

comb Ridge; in 1961-1962 it was the most common bat flying in the early evening.

Eptesicus fuscus pallidus Young. Big Brown Bat. Benson (1935) reported this species from Navajo Mountain Trading Post.

Antrozous pallidus pallidus (LeConte). Pallid Bat. The occurrence of the pallid bat in the Kaiparowits region has not been reported in the literature. Pritchett (1962) reports it as the most common late-flying bat (after 2300 hours) near the Old Paria townsite. He collected specimens there in 1961 and 1972. BYU (1973) observed them at Sites 2 and 3.

Molossidae (Free-tailed Bats)

Tadarida brasiliensis mexicana (Saussure). Brazilian Free-tailed Bat. Durrant (1952) indicates the Brazilian free-tailed bat occurs throughout southern Utah, but did not list a reference for any being collected in the environs of the Kaiparowits Plateau. Hardy (1941) records them as occurring in Zion National Park. BYU did not collect this species during this study, or did Pritchett (1962). However, they are one of the most common bats in Carlsbad Caverns in New Mexico and we are including them as part of the fauna of the Kaiparowits Plateau.

Leporidae (Hares and Rabbits)

Sylvilagus nuttallii (Bachman). Nuttall Cottontail. This species is restricted to the higher elevation with *S. n. grangeri* (Allen) occurring in Bryce Canyon and vicinity as reported by Presnall (1934). The subspecies *S. n. pinetis* (Allen) was reported for Navajo Mountain by Benson (1935) and is apparently restricted to the mountain ranges east of the Colorado River. One was observed by BYU near Site 33, which is one mile north of the confluence of the Colorado and San Juan Rivers.

Sylvilagus audubonii (Baird). Desert Cottontail. Durrant (1952) reported *S. a. arizonae* (Allen) to be found seven miles southwest of Tropic, Utah. The range of the subspecies *S. a. warreni* Nelson in the Kaiparowits is uncertain. Benson (1935) reported the latter subspecies from the mesa top south of Navajo Mountain. The Desert Cottontail

or their signs have been observed throughout most of the Kaiparowits Basin, but no specimens have been retained (BYU 1971-1974).

Lepus americanus bairdi Hayden. Snowshoe Rabbit. Russell and Thompson (1964) list this species as occurring in Bryce Canyon. Durrant (1952) includes the northwest portion of the Kaiparowits Basin within its range.

Lepus townsendii Bachman. White-tailed Jack Rabbit. Durrant (1952) includes the northwest portion of the Kaiparowits Basin in the range of this species. Russell and Thompson (1964) list it for Bryce Canyon. We did not find this species on any of our collection sites.

Lepus californicus Gray. Black-tailed Jack Rabbit. It is common throughout Utah west of the Colorado River. This animal has been observed by BYU (1971-1974) crews at nearly every site studied. They have been common in Butler Valley, Four Mile Bench, Smoky Mountain, and Cedar Mountain. The subspecies *L. c. texianus* Waterhouse was observed by our crews east of the Colorado River at Sites 19, 20, 21, and 22 near Navajo Mountain (BYU 1971-1974). Benson (1935) reported it for the mesa top south of Navajo Mountain.

Sciuridae (Squirrels, Prairie Dogs)

Eutamias minimus consobrinus (Allen). Least Chipmunk. Presnall (1934 and 1938) reported this species for Bryce Canyon. We have a single collection from Brigham Plains and have observed it at Site 2 (BYU 1972 and 1973).

Eutamias dorsalis utahensis Merriam. Cliff Chipmunk. Durrant (1952) cites a specimen which was collected eight miles south of Escalante. Pritchett (1962) collected it on the Cockscomb Ridge. BYU records (1972-1973) are for Sites 2, 27, and 28.

Eutamias quadrivittatus (Say). Say Chipmunk. Presnall (1934) reported that chipmunks were common at Bryce Canyon. Durrant (1952) examined a specimen of *E. q. adsitus* (Allen) from Bryce Canyon. Tanner (1940a) collected a specimen from the northern part of the Kaiparowits Basin. We have a single record from Site 27 (BYU 1974). The subspecies *E. q. hopiensis* Merriam was

reported by Benson (1935) from Rainbow Bridge and Navajo Mountain. Durrant and Dean (1959) reported two collections from the mouth of Kane Creek. BYU records (1971-1974) are from sites 2 and 15, near Page, along the Colorado River in Driftwood and Reflection Canyons, and in Three Garden one mile above the San Juan confluence with Lake Powell.

Marmota flaviventris engelharti Allen. Yellow-bellied Marmot. The only records of this species for the Kaiparowits Basin are those of Patraw and Gray (1932) and Presnall (1934) for Bryce Canyon.

Ammospermophilus leucurus (Merriam). Antelope Ground Squirrel. According to Hansen (1955), two subspecies occur in the Kaiparowits Basin, viz. *A. l. escalante* (Hansen) on the west side of the Colorado and *A. l. cinnamomeus* (Merriam) on the east side. BYU crews (1971-1974) have recorded the former subspecies for Sites 1, 2, 3, 4, 8, 10, 14, 16, 18, 23, 27, 28, and 30, and in all the drainages west of the Colorado. The latter subspecies was reported by Benson (1935) from Rainbow Lodge. Cockrum (1960) collected it at Lee's Ferry, and BYU (1971-1972) collected it at Sites 19, 20, 21, and 22, and at Three Garden.

Spermophilus spilosoma cryptospilotus Merriam. Spotted Ground Squirrel. This species was observed by Benson's party on 13 June 1934, five miles south of the summit of Navajo Mountain (Benson 1935). BYU (1972) records are from Sites 20 and 21.

Spermophilus variegatus (Erxleben). Rock Squirrel. Presnall (1934) reported that *S. v. utah* was frequently seen in Bryce Canyon and Tanner (1940a) reported it for the Kaiparowits Basin. BYU (1972-1973) records are from Cottonwood Wash, Last Chance, Pet Hollow, and Grosvenor Arch. Durrant and Dean (1959) observed *S. v. utah* sporadically throughout Glen Canyon and obtained one specimen of *S. v. grammurus* (Say) at Aztec Creek. BYU personnel also observed specimens on both sides of Lake Powell. Benson (1935) reported that this species has been observed at Rainbow Lodge and Navajo Trading Post.

Spermophilus lateralis lateralis (Say). Golden-mantled Ground Squirrel. Presnall (1934) reported it as common on the rim of

Bryce Canyon. Tanner (1940a) reported it for the Kaiparowits Basin.

Cynomys parvidens Allen. Prairie Dog. Presnall (1934) reported two small prairie dog towns in Bryce Canyon, "one near Fairyland (on the rim) and another about two miles farther north. A total of about two dozen occupied burrows." Tanner (1940a) reported this species for the Kaiparowits Basin.

Tamiasciurus hudsonicus dixiensis Hardy. Red squirrel. Presnall (1934, 1937) indicates that this species was quite common in Bryce Canyon during the 1920s. During 1933 he observed only two families and six in 1934; in 1935, however, they were quite numerous.

Glaucomys sobrinus lucifugus Hall. Northern Flying Squirrel. This species was collected 10 miles southwest of Bryce Canyon by Lowell Hansen and reported by Tanner (1940b). Russell and Thompson (1964) listed it as a rare species in Bryce Canyon.

Geomyidae (Pocket Gophers)

Thomomys bottae (Eydoux & Gervais). Botta Pocket Gopher. Benson (1935) referred the material described by Goldman (1937) to *T. b. alexandre* Goldman based on material collected on Navajo Mountain. According to Durrant (1952) and Cockrum (1960) this subspecies is known only from Navajo Mountain and the vicinity south of the San Juan and east of the Colorado River. *Thomomys b. absonus* Goldman, according to Durrant (1952), occurs only on the west side of the Colorado and lists a specimen from Escalante. Our (BYU 1971) only collection is from Site 3 on Cedar Mountain. However, their tunnels are scattered throughout the region. Presnall (1934) reported that pocket gophers were abundant in Bryce Canyon and are probably referable to the latter subspecies.

Heteromyidae (Kangaroo Rats, Pocket Mice)

Perognathus flavus hopiensis Goldman. Silky Pocket Mouse. Benson (1935) indicates that four specimens were collected five miles southeast of Navajo Mountain Trading Post and three from the environs of the trading post. Durrant (1952) says they are confined to the region east of the Colorado River in loose, sandy, sparsely vegetated areas.

Perognathus apache Merriam. Apache Pocket Mouse. Benson (1935) reports three collections of *P. a. apache* Merriam from the vicinity of Navajo Mountain. According to Durrant and Dean (1959) and Cockrum (1960), this subspecies is restricted to the area south of the San Juan River on the east side of the Colorado. *P. a. caryi* Goldman is restricted to the east side of the Colorado River above the San Juan River (Durrant and Dean 1959). The only specimens of this subspecies from the Kaiparowits Basin are those collected by BYU (1972) at Three Garden above the confluence of the San Juan/Colorado Rivers.

Perognathus longimembris (Coues). Little Pocket Mouse. This species is represented in the Kaiparowits Basin by two subspecies, one occurring on each side of the Colorado River. *Perognathus l. arizonensis* Goldman is restricted to the west side of the river and was reported by Durrant and Dean (1959) from Kane Creek and at river mile 34. Our records (BYU 1971-1974) are from Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 23, 27, 28, and 30. Benson (1935) described *P. l. acrus* (Benson) from material collected at Rainbow Bridge (type #58624). Durrant and Dean (1959) took one specimen from river mile 43. Our records (BYU 1971-1972) are from Sites 19, 20, 21, and 22; all are east of the Colorado River.

Perognathus amplus ammodytes Benson. Arizona Pocket Mouse. Cockrum (1960) indicates that this species has been taken along the Echo Cliffs which is the southern boundary line for the Kaiparowits Basin.

Perognathus formosus domisaxensis Cockrum. Long-tailed Pocket Mouse. Durrant and Dean (1959) collected four specimens from Kane Creek, i.e., one from river mile 34 and three at Lee's Ferry, and indicated, "Ecologically, these pocket mice differ somewhat from those kinds farther west. They appear to favor more rocky areas and occur on hillsides and at the junction of hillsides and stabilized terraces." Our records (BYU 1971-1974) are from Sites 4, 9, 10, 15, 27, 28, and 30. In addition, material from Three Garden located one mile north of the confluence of the San Juan on the east side of the Colorado River has been tentatively referred to this species. When additional material is

obtained and analyzed, it may prove, however, to be *P. intermedius crinitus*.

***Perognathus intermedius crinitus* Benson.** Rock Pocket Mouse. According to Durrant and Dean (1959), this subspecies is confined to the east side of the Colorado River south of the San Juan River. No specimens were obtained by them until they reached Aztec Creek at river mile 68.5. Between this point and river mile 28 they collected 15 specimens. Benson (1934b) reported a collection from Navajo Mountain Trading Post and two specimens from Rainbow Bridge. Cockrum (1960) obtained specimens from Lee's Ferry. BYU (1973) obtained specimens from Three Garden near the confluence of the San Juan and Colorado River Canyons. These specimens document the range of this species north of the San Juan River.

***Dipodomys ordii* Woodhouse.** Kangaroo Rat. Two subspecies occur in the Kaiparowits Basin and, of the two, *D. o. cupidinus* Goldman is restricted to the west side of the Colorado south of the Escalante River. Specimens have been collected by Durrant and Dean (1959) at Lee's Ferry and Kane Creek; Presnall (1934) for Bryce; Tanner (1940a) for the Kaiparowits Basin; and BYU (1971-1974) for Sites 1, 2, 3, 4, 6, 7, 8, 10, 13, 14, 15, 17, 27, 28, 30, and 33.

***Dipodomys o. longipes* (Merriam)** is confined to the area south of the San Juan River and east of the Colorado (Durrant and Dean 1959). Benson (1935) reports nine collections from south of Navajo Mountain. Our records (BYU 1971-1972) are from Sites 19 and 33.

Castoridae (Beaver)

***Castor canadensis repentinus* Goldman.** Beaver. Prior to the coming of the white trappers, beavers were widespread throughout the length of the Colorado River and its tributaries. This abundance of beaver enticed the famous French trapper and fur trader Denis Julien to navigate the Colorado in 1836 as far south as Cataract Canyon. The best-known trapper in the Canyon was Nathan Galloway; in 1895, 1896, and on other occasions he traveled from Green River to Lee's Ferry with William Richmond (Crampton 1959). Durrant and Dean (1959) reported that the populations in Glen Canyon were

among the largest in the state. During the course of their expedition, 30 June to 9 August 1958, they observed beaver or their signs daily. They indicated that these bank dwellers fed almost entirely on willows and only on one occasion was *Tamarix* utilized. The creation of Lake Powell has nearly eliminated their main source of food and greatly reduced their numbers. Observations by BYU field crews (1971-1974) indicate that beavers utilize representatives of nearly every woody species in the drainages of the Colorado. They have, of necessity, been pushed into the side canyons, particularly where permanent springs or seeps exist. It appears that they have attempted to build dams in some of these regions to create a more suitable habitat.

Cricetidae (Voles, Rats, Mice)

***Reithrodontomys megalotis* (Baird).** Western Harvest Mouse. The subspecies *R. m. megalotis* (Baird) is restricted to the west side of the Colorado River in the Glen Canyon area. Cockrum (1960) collected it at Lee's Ferry; Durrant and Dean (1959) collected specimens at river mile 43 and 93; and BYU (1971-1974) collected it at Sites 2, 3, and 10. Durrant and Dean (1959) collected *R. m. aztecus* J. A. Allen on the east side of the Colorado at river miles 43 and 83.

***Peromyscus eremicus eremicus* (Baird).** Cactus Mouse. Cockrum (1960) reported it from the south side of the Colorado at Lee's Ferry.

***Peromyscus maniculatus* (Wagner).** Deer Mouse. Durrant and Dean (1959) have established that *P. m. sonoriensis* (LeConte) is the only subspecies of Deer Mouse in Glen Canyon and that it was the most common mammal in Glen Canyon during their study. They collected specimens from Lee's Ferry to river mile 78 on the Colorado. Presnall (1934) reported this subspecies from Bryce Canyon; Benson (1935) indicated that it was the most abundant mammal in the region of Navajo Mountain; and BYU (1971-1973) collected it at Sites 1, 2, 3, 6, 7, 8, 15, 19, 22, 27, 28, and 30, and Navajo Mountain.

***Peromyscus crinitus* Merriam.** Canyon Mous. Two subspecies of the Canyon Mouse occur in the Kaiparowits Basin, viz. *P. c.*

auripectus (Osgood) and *P. c. stephensi* (Mearns). Durrant and Dean (1959) noted that subspecies *auripectus* occurred only on the east side of Glen Canyon and collected specimens at river miles 21, 28, 69, 78, and 83. Benson (1935) reported one from Rainbow Bridge and Navajo Mountain Trading Post. Additional records are: BYU (1972) Site 19, BYU (1971–1974) Three Garden above confluence of the San Juan and Lake Powell, and Cockrum (1960) at Lee's Ferry and Navajo Mountain.

Peromyscus c. stephensi, as reported by Durrant and Dean (1959), occurs throughout the Kaiparowits Basin west of the Colorado River. They made collections at river miles 23, 41, 56, and 88, and at Lee's Ferry; BYU (1971) collected this subspecies at Sites 5, 6, 8, and 12; BYU (1972) also collected it at Sites 23, 27, and 30.

Peromyscus boylii (Baird). Brush Mouse. Two subspecies occur in the Kaiparowits Basin, viz. *P. b. rowleyi* (Allen) and *P. b. utahensis* Durrant. The former species is restricted to the east side of the Colorado and has been collected at river miles 28, 43, 69, 78, and 83 by Durrant and Dean (1959). Cockrum (1960) cites a specimen from Rainbow Lodge at the southwest base of Navajo Mountain and BYU (1972–1974) cites specimens from Three Garden near the San Juan confluence and at Pool Garden in Reflection Canyon.

The latter subspecies, *Peromyscus b. utahensis*, occurs only on the west side of the Colorado and has been collected by Durrant and Dean (1959) from river miles 34, 41, and 56 and by BYU (1971) from Site 8 and from Reflection Canyon. Durrant and Dean indicate that this subspecies was nearly as common as the deer mice. They are reported to be excellent climbers, preferring brushy habitats among cliffs and rocky areas.

Peromyscus truei (Shufeldt). Pinyon Mouse. Benson (1935) reported a collection from the mesa top near Navajo Mountain and one from the Trading Post. Presnall (1934) reported this species from Bryce Canyon. During the course of our study (BYU 1971–1974), we have records for this species from Sites 2, 3, 6, 13, 14, 19, 20, 21, 23, 27, 28, and 30, and Navajo Mountain.

Peromyscus difficilis nasutus (Allen) (= *Peromyscus nasutus nasutus* Allen). Long-nosed Deer Mouse. Benson (1935) reported this species from Rainbow Bridge in rocky places where stands of *Juniperus* occur.

Onychomys leucogaster (Wied-Neuwied). Northern Grasshopper Mouse. Durrant (1952) indicates that *O. l. melanophrys* Merriam is confined to the west side of the Colorado River. Presnall (1934) reported it from Bryce Canyon and BYU (1971–1974) from Sites 1, 2, 3, 4, 6, 8, 14, 17, 18, and 30; *O. l. pallescens* Merriam is confined to the east side of the Colorado River (Durrant 1952). Available records are: Benson (1935) several specimens from 5 and 7 miles south of Navajo Mountain and BYU (1971–1972) from Sites 19, 20, and 22. One specimen (No. 181 from Nipple Bench) collected by BYU (1971) appears to be an intergrade between these two subspecies.

Neotoma albigula laplataensis Miller. White-throated Wood Rat. Durrant and Dean (1959) indicate that this species is confined to the east side of the Colorado River in Glen Canyon. Collections were made at river miles 69 and 78. Benson (1935) reported a collection from Rainbow Bridge and the mesa top south of Navajo Mountain. Studies by BYU (1971–1974) in Glen Canyon and vicinity confirm the observations of Durrant and Dean. In addition, collections by BYU (1971–1972) were made at Sites 19 and 21.

Neotoma lepida monstabilis Goldman. Desert Wood Rat. Durrant and Dean (1959) state that, "members of this species are the counter parts of *N. albigula* and *N. mexicana* of western side of the Colorado River." Collections of *N. l. monstabilis* were made at river miles 41, 56, 88, and 91. Additional records for the Kaiparowits Basin are: Presnall (1934) Bryce; Tanner (1940a) Kaiparowits Basin; Pritchett (1962) Cockscomb; and BYU (1971) Sites 1, 2, 3, 4, 6, 8, 12, and 13, Step Garden, and Reflection Canyon.

Neotoma stephensi relicta Goldman. Stephen's Wood Rat. Benson (1935) reported one collection from Rainbow Bridge, four specimens from south of Navajo Mountain on the mesa top, and four from Navajo Mountain Trading Post. We have not collected this species at any of our sites. •

Neotoma mexicana inopinata Goldman. Mexican Wood Rat. This species is restricted to the east side of Glen Canyon (Durrant and Dean 1959). Specimens were obtained by them from river miles 69, 78, and 83. Benson (1935) reported it from War God Spring on Navajo Mountain. BYU (1972–1974) record are from Three Garden just above the confluence of the San Juan on the east side of the Colorado River and from Ribbon Garden in Ribbon Canyon.

Neotoma cinerea arizonae Merriam. Bush-tailed Wood Rat. According to Durrant and Dean (1959), *N. cinerea* is the only species of wood rat that occurs on both sides of Glen Canyon. *Neotoma c. arizonae* occurs only on the east side and *N. c. acraia* on the west side. However, no specimens of the latter subspecies were reported by Durrant and Dean. They did collect specimens of *N. c. arizonae* from river miles 21, 43, and 83. Additional records for the Kaiparowits Basin are: BYU (1971–1972) Navajo Mountain, Site 27, and Site 33.

Microtus mexicanus navajo Benson. Mexican Vole. Benson (1934a and 1935) described this species from specimens obtained from Soldier and War God Springs on the east slope of Navajo Mountain. They were collected in a *Ceanothus*, *Symphoricarpos*, *Arctostaphylos*, and *Rosa* vegetation type. This taxon is known only from the type collections.

Lagurus curtatus intermedius (Taylor). Sagebrush Vole. Presnall (1934) reported a specimen from Bryce Canyon, but was unable to assign a species name. Durrant (1952) cites a specimen of this species from David Hollow in Bryce Canyon that may be the one cited by Presnall. We did not encounter this species at any of our trap sites.

Erethizontidae (Porcupine)

Erethizon dorsatum (Linnaeus). Porcupine. According to Durrant (1952) two subspecies occur in the Kaiparowits Basin, viz. *E. d. epixanthum* Brandt on the west side of the Colorado River and *E. d. cousei* Mearns on the east side. Durrant and Dean (1959) reported that expedition members observed one animal in Navajo Canyon. Weight (1932) and Presnall (1934) reported the former sub-

species from Bryce Canyon and BYU (1971–1972) reported it from Sites 2, 3, and 4, and Reflection Canyon. Their signs are not uncommon in stands of *Pinus edulis*.

Canidae (Coyotes, Foxes, and Wolves)

Canis latrans Say. Coyote. Two subspecies occur in the Kaiparowits Basin, i.e., *C. l. estor* Merriam and *C. l. lestes* Merriam. The former is by far the most common reported by Tanner (1940a) for the Kaiparowits Plateau; by BYU (1971) for Sites 3, 10, 11, 12, 15, and Wahweap Creek; by BYU (1972) for Site 14, Butler Valley, Cottonwood Wash, Coyote Creek, near Glen Canyon, and Warm Creek; and by BYU (1973) for Sites 3, 6, 8, 23, 27, and 28, and Smoky Mountain. The first record of this species in Glen Canyon was made by members of Powell's first Colorado River expedition in 1869. While in the vicinity of the Escalante River, Sumner (Powell 1875) records as follows. "Dunn killed a half-stayed coyote near camp, the only sign of animal life we have seen for three days." Durrant and Dean (1959) observed numerous signs of coyotes in Glen Canyon proper and in several side canyons. The senior author, in company with S. L. Welsh and J. R. Murdock, witnessed in 1971 the fall and death of a coyote from a 200-foot cliff in Last Chance Creek.

Canis l. lestes is known only from the northern portion of the Kaiparowits Basin as reported by Presnall (1934) from Bryce Canyon. BYU (1973) observed coyotes north of Canaan Mountain along Highway 12 and these may be *C. l. lestes*.

Canis lupus youngi Goldman. Wolf. According to Young and Goldman (1944) and Cockrum (1960), the wolf formerly occurred throughout this region, but no specimens were cited. It is doubtful that it occurs in the Basin at the present time.

Vulpes vulpes macroura Baird (= *Vulpes fulva macroura* Baird). Red Fox. At present the red fox is rare in Utah due to hunting, trapping, and use of poison bait stations. Several records were reported prior to 1940. Presnall (1934) reported that this animal was occasionally seen at Bryce Canyon; Benson (1935) reported one from the north side of Navajo Mountain; Durrant and Dean (1959)

indicate that one was seen two miles east of Rainbow Bridge by a member of their expedition. Durrant (1952) cites one from Wahweap Creek and states, "possibly the red fox of the Colorado River is an undescribed subspecies . . . and I tentatively refer them to *V. f. macroura*."

Urocyon cinereoargenteus scottii Mearns. Gray Fox. The gray fox occurs throughout the Basin and has been reported by Presnall (1934) for Bryce Canyon and Benson (1935) for Navajo Mountain; and Hayward et al. (1958) reported their signs from nearly all areas studied from the Paria to the Escalante River. BYU (1971-1974) observed this animal in Cottonwood Wash, Cockscomb, and on Brigham Plains. This species is much more common than the Red Fox.

Ursidae (Bears)

Ursus americanus cinnamomum Audubon & Bachman. Black Bear. Presnall (1934) indicated that in 1922 a black bear was killed in Bryce Canyon; and "Mr. Ruby Syrett and Ranger Cope both say that black and grizzly bears used to cross the Bryce Canyon region at irregular intervals, apparently traveling between the Parowan Mountains on the west and the Escalante Mountains on the east. Bears are still found in both ranges, although rarely." One of us (Atwood) observed in 1965 tracks of a bear on the south slope of the Boulder Mountains. On 11 June 1975, tracks of a solitary bear were observed by S. L. Welsh at the head of Paradise Canyon about 11 miles north of Horse Mountain junction. The left hind foot track measured 10.2×22.9 cm. In late June 1975, a small bear was sighted at Canaan Peak by BYU personnel.

Ursus horribilis Merriam. Grizzly Bear. Presnall (1934) indicates that they have crossed through Bryce. For additional information the reader is referred to the discussion of the preceding species.

Procyonidae (Ring-tailed Cat, Raccoon)

Bassariscus astutus (Lichtenstein). Ring-tailed Cat. According to Durrant (1952) the Colorado River serves as a barrier for two subspecies. A specimen of subspecies *B. a. arizonensis* Goldman was obtained from W.

Wilson, which he had shot in a chicken coop at Rainbow Lodge in November 1932 (Benson 1935). Wetherill, Flattum, and Stearns (1961) recorded in their journal on 15 January 1931 that a ring-tailed cat came into camp. They were in or near Bridge Canyon. The entry by John Wetherill on 17 January states, "Lots of skunks around, some ring-tailed cats, fox. . . ." *Bassariscus a. nevadensis* Miller has been reported by trappers and local residents of Kaiparowits Basin to be fairly common. Durrant and Dean (1959) observed small five-toed tracks in the talus dust and along the base of ledges throughout Glen Canyon. During the course of our study we have not met directly with this animal, but have observed their tracks in the major drainages.

Procyon lotor pallidus Merriam. Raccoon. Hall and Kelson (1959) list this subspecies as occurring throughout the Colorado and its tributaries. Durrant and Dean (1959), however, were unable to find any evidence to verify their presence in the Colorado drainage. Observations by BYU (1971-1974) confirmed the conclusions of Durrant and Dean.

Mustelidae (Weasels, Skunks, etc.)

Mustela erminea muricus (Bangs). Ermine. Durrant (1952) reports one specimen from Boulder Mountain north of Escalante. This species probably occurred throughout the Boulder Mountains and probably in the region of Bryce Canyon.

Mustela frenata nevadensis Hall. Long-tailed Weasel. Presnall (1934) reported this species was common at Bryce Canyon. Benson (1935) indicated that one was observed at Rainbow Lodge in 1932. The Long-tailed Weasel is probably the most widely distributed carnivore in Utah (Durrant 1952).

Taxidea taxus berlandieri Baird. Badger. Presnall (1934) indicated that they were common on the rim of Bryce Canyon. Benson (1935) observed fragments of badger taken by trappers in the Navajo Mountain region. Tanner (1940a) reported them from the Kaiparowits Plateau. Durrant and Dean (1959) indicated that this species was one of the most common and abundant carnivores in Glen Canyon. They observed their tracks and burrows everywhere. Our records (BYU

1971–1974) indicate their presence at Sites 1, 3, 13, 19, 27, and 34, and in every drainage in the basin.

***Spilogale gracilis* Merriam.** Spotted Skunk. The Colorado River is a barrier for lateral movement of this animal with *S. g. gracilis* Merriam confined to the east side. It was reported by Benson (1935) for the Navajo Mountain area. *S. g. saxatilis* (Merriam) is reported by Presnall (1935) from Bryce Canyon. BYU (1972) noted their occurrence on Cedar Mountain south of Glen Canyon City and in Little Valley Creek at the south base of the Kaiparowits Plateau. Durrant and Dean (1959) observed signs of this species on both sides of the Colorado River, and one was observed by investigators from BYU at Three Garden on the east side of Glen Canyon.

***Mephitis mephitis estor* Merriam.** Striped Skunk. Presnall (1934) indicates that this species was rare at Bryce Canyon. Durrant (1952) reports that the subspecies *M. m. estor* is limited to the Colorado River drainage in southern and eastern Utah. Specimens are cited for both San Juan and Washington Counties, but are not cited for the Kaiparowits Basin.

***Lontra canadensis nexa* Goldman.** River Otter. Gregory (1938) reports otter from Glen Canyon. Durrant and Dean (1959) question his recording of the species in Glen Canyon, but do not discard the possibility entirely.

Felidae (Cats)

***Felis concolor kaibabensis* Nelson & Goldman.** Mountain Lion. Benson (1935) indicates that an animal was killed near Inscription House by Navajos. Presnall (1934) reported that an occasional lion wanders through Bryce Canyon. Observations of this species were made by BYU (1971 and 1973) in Nipple Creek, Tibbet Canyon, and Willow Creek. The observation in Willow Creek was a female with two kittens. In addition, a solid-black-colored lion was observed October 1976 on Cannon Peak.

***Lynx rufus baileyi* Merriam.** Bobcat. Apparently the only specimens available from the Kaiparowits Basin are those collected by BYU (1973) in Tibbet Canyon, Buckskin

Gulch, and Cottonwood Canyon. Tracks and scat have been observed throughout the region.

Cervidae (Deer and Elk)

***Cervus elaphus nelsoni* V. Bailey.** Wapiti, Elk. Cope (1932) reported that A. W. Ivins, an early resident of this region, informed him that, according to the Indians, elk once resided in Bryce Canyon and the Paria Valley. Mr. Ammon Davis, of Cannonville, informed him that he had found part of the head and horns of a bull elk on Willis Creek just southeast of Bryce Canyon Rim. This material is now in the museum collection of Bryce. Presnall (1934) reports further on the elk of Bryce-Paria Valley as follows: "now extinct in this region, but one was reported killed in Willis Creek many years ago by a Mr. Johnston of Cannonville."

There is some question as to which is the correct name, i.e., *Cervus canadensis nelsoni* V. Bailey or *Cervus elaphus* L. Since the question has yet to be resolved, this treatment follows Durrant (1952).

***Odocoileus hemionus hemionus* (Rafinesque).** Mule Deer. No records of deer in the Kaiparowits were made by early explorers of the region. Presnall (1934) indicated that they were common in Bryce Canyon. During the course of our study (BYU 1971–1974) frequent sightings have been made, especially along tributary canyons along Lake Powell. Animals have been observed only where water and forage are adequate throughout the year and they appear to be residents. The main areas of concentration (sens. lat.) are on Four Mile Bench, Cockscomb, Canaan Mountain, Bryce Canyon, and the Kaiparowits Plateau.

Antilocapridae (Pronghorn)

***Antilocapra americana americana* (Ord).** Pronghorn. Tanner (1940a) indicates that pronghorn antelope were common in the Kaiparowits Basin in pioneer days. Presnall (1938) also reported their occurrence at Bryce Canyon. Apparently the early herds were hunted too severely because records since the beginning of this century are lacking.

In November 1971 some 104 antelope were transplanted from northeastern Utah to East Clark Bench, 10 miles west of Glen Canyon City, Utah. Since then, 40 separate sightings of these animals have been recorded by personnel of the U.S. Bureau of Land Management and BYU (1971-1974). These sightings, for the most part, have been in Cottonwood Wash, East and West Clark Benches, Coyote Creek, and as far north as Butler Valley and on Nipple Bench. Sightings were infrequent in 1974 and even fewer in 1975; in 1976 a pair was known to range in the vicinity of Nipple Spring.

Bovidae (Bovids)

Ovis canadensis canadensis Shaw. Mountain Sheep. Powell's party made several references to these animals and occasionally used them for food. On 27 July 1869, Sumner recorded (Powell 1875), "Killed two mountain sheep today—a Godsend to us, as our bread and rotten bacon is a poor diet for as hard work as we have to do." Then on 3 August below Music Temple, Sumner recorded, "pulled out early, made a good run. Saw two mountain sheep in a little valley on the south side. How they got there I will leave others to judge, as there is no outlet to the valley that a man can climb. Killed one and chased the other through the natural pasture for an hour and pulled out again." Gregory and Moore (1931) reported sheep from Dark Canyon at the southeast base of the Kaiparowits Plateau.

Durrant (1952) indicates that the species is disappearing rapidly, and if adequate specimens from extreme south central Utah are available for study, they would probably prove to be *O. c. mexicanus*.

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